MARKETING OF AGRICULTURAL PRODUCTS AND ROLE OF EXTENSION SERVICE IN MEZAM, CAMEROON

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ABSTRACT

The Marketing of Agricultural Products: the role of Agricultural Extension Service Delivery in Mezam Division, Cameroon has as objectives: to analyze the relationship between Agricultural extension service and the marketing of agricultural product and to evaluate the relationship between extension service and marketing of agricultural product by gender of household head. Methodologically, the study employed IV-2SLS model, using primary data collected among farmers in the Mezam using a well-structured questionnaire. The result shows that agricultural extension services has a positive and significant effect on the marketing of agricultural products. The result is both a male and female farmers' phenomenon, though with a stronger magnitude among female farmers. The study suggest that decision makers should increase the activities of extension service delivery in the agricultural sector, it is a wise step towards economic development.
Keywords: *Extension Service Delivery, Agricultural Marketing, products, IV-2SLS, Bamenda*

INTRODUCTION

Despite the positive growth experienced by the agricultural sector since the mid-1980s, bottlenecks that inhibit agricultural productivity remain. A study conducted by Assuming et al (2018) indicated that average yields in agriculture have remained stagnant. They noted that

generally, increases in agricultural production have been achieved primarily by farmers using extensive methods such as increased land area and manual labour. Agriculture is predominantly practiced on a smallholder basis on family-operated farms. The majority of agricultural producers in Cameroon still use the “cutlass and hoe” approach in crop production with technological change very slow and minimal (Assuming et al., 2018; Anderson, 2007).

Agricultural extension services provision is underpinned by ‘productivity gap theory’ (Waddington, 2010). This theory states that, extension services can be organized and delivered in a variety of forms, but their ultimate aim is to increase farmers' productivity and income. Productivity improvements are only possible when there is a gap between actual and potential productivity. He suggests two types of ‘gaps’ contribute to the productivity differential - the technology gap and the management gap. He concludes that provision of extension services can contribute to the reduction of the productivity differential by increasing the speed of technology transfer and by increasing farmers' knowledge and assisting them in improving farm management practices.

The productivity gap theory, however, is flawed in that it cannot solely contribute to reduction of the productivity differential without making allusion to any assumptions. It must be noted that agriculture in Mezam is rain-fed. In the face of provision of extension services, variations in weather conditions, particularly unfavorable weather, could decrease farm productivity and income to even widen the productivity gap. Furthermore. Most agricultural extension leaders are still operating on the basis of the 20th century agricultural development strategy when food security was the national priority (Swanson et al., 2011). Therefore, most national extension systems continue to focus on increasing the productivity of the major food crops (e.g., rice, wheat, maize, etc.) and other commodities,

even though multi-national life-science companies are becoming the primary source of new technologies for these crops (e.g., new varieties/hybrids and agro-chemicals) worldwide. In addition, as mentioned above, due to these productivity increases, the world now has a surplus of these basic commodities and prices are falling.

Agricultural marketing can best be defined as series of services involved in moving a product from the point of production to the point of consumption. Thus agricultural marketing is a series of interconnected activities involving: planning production, growing and harvesting,, grading, packing, transport, storage, agro- and food processing, distribution, and sale (Ndoye and . Kaimowitz, 2010). Such activities cannot take place without the exchange of information and are often heavily dependent on the availability of suitable finance. Marketing systems are dynamic. They are competitive and involve continuous 21 change and improvement. Businesses that have lower costs are more efficient and can deliver quality products are those that prosper. Those who have high costs, do not adapt to changes in market demand and provide poor quality are often forced out of business. Marketing has to be customer-oriented and has to provide the farmer, transporter, trader, processor, etc. with a profit.

This requires those involved in marketing chains to understand buyer requirements, both in terms of product and business conditions (Moni, 2016). Several organizations provide support to developing countries to develop their agricultural marketing systems, including FAO's agricultural marketing unit and various donor organizations. There has also recently been considerable interest by NGOs to carry out activities to link farmers to markets (Ndoye and Kaimowitz, 2010). Improvement of marketing systems necessitates a strong private sector backed up by appropriate policy and legislative frameworks and effective government support services. Such services can include provision of

market infrastructure, supply of market information, and agricultural extension services able to advise farmers on marketing.

Training in marketing at all levels is also needed. One of many problems faced in agricultural marketing in developing countries, is the latent hostility to the private sector and the lack of understanding of the role of the intermediary. "Middleman" has become very much a pejorative word. Efficient marketing infrastructures such as wholesale, retail, and assembly markets and storage facilities are essential for cost-effective marketing, to minimize post-harvest losses and to reduce health risks. Markets play an important role in rural development, income 22 generation, food security, developing rural-market linkages and gender issues (Alex et al., 2004). Planners need to be aware of how to design markets that meet a community's social and economic needs and how to choose a suitable site for a new market. In many cases sites are chosen that are inappropriate and result in under-use or even no use of the infrastructure constructed. It is also not sufficient just to build a market: attention needs to be paid to how that market will be managed, operated, and maintained (Boko et al.., 2017).

In most cases, where market improvements were only aimed at infrastructure upgrading and did not guarantee maintenance and management, most of them failed within a few years (Fritschel, 2013). Rural assembly markets are located in production areas and primarily serve as places where farmers can meet with traders to sell their products. These may be occasional (perhaps weekly) markets, such as heat bazaars in India and Nepal, or permanent. Terminal wholesale markets are located in major metropolitan areas, where produce is finally channeled to consumers through trade between wholesalers and retailers, caterers, etc. The characteristics of wholesale markets have changed considerably as retailing changes in response to urban growth, the increasing role of supermarkets and increased

consumer spending capacity (Courade and Alary, 2007). These changes require responses in the way in which traditional wholesale markets are organized and managed. Retail marketing systems in western countries have broadly evolved from traditional street markets through to the modern hypermarket or out-of-town shopping center (FAOSTAT, 2014).

Most governments in developing countries have tried to provide market information services to farmers, but these have tended to experience problems of sustainability. Moreover, even when they function, the service provided is often insufficient to allow commercial decisions to be made because of time lags between data collection and dissemination (FAOSTAT, 2014). Modern communications technologies open up the possibilities for market information services to improve information delivery through SMS on cell phones and the rapid growth of FM radio stations in many developing countries offers the possibilities of more localized information services. In the longer run, the internet may become an effective way of delivering information to farmers. However, problems associated with the cost and accuracy of data collection still remain to be addressed. Even when they have access to market information, farmers often require assistance in interpreting that information.

For example, the market price quoted on the radio may refer to a wholesale selling price and farmers may have difficulty in translating this into a realistic price at their local assembly market (Makapela, 2015). Various attempts have been made in developing countries 24 to introduce commercial market information services but these have largely been targeted at traders, commercial farmers or exporters. It is not easy to see how small, poor farmers can generate sufficient income for a commercial service to be profitable, although, in India a new service introduced by Thompson Reuters was reportedly used by over 100,000 farmers in its first year of operation (Makapela,

2015).Farmers frequently consider marketing as being their major problem. However, while they are able to identify such problems as poor prices, lack of transport and high post-harvest losses, they are often poorly equipped to identify potential solutions. Successful marketing requires learning new skills, new techniques and new ways of obtaining information. Extension officers working with ministries of agriculture or NGOs are often well-trained in horticultural production techniques but usually lack knowledge of marketing or post-harvest handling (FAOSTAT, 2014).

Ways of helping them develop their knowledge of these areas, in order to be better able to advise farmers about market-oriented horticulture, need to be explored. While there is a range of generic guides and other training materials available from FAO and others, these should ideally be tailored to national circumstances to have maximum effect. Jain (1998) in his paper, "Market structure and performance of Regulated market" highlights that most of the farmers are not aware of the functioning of regulated market due to lack of proper propaganda. Adequate storage facilities are not available in the selected market. Marketing efficiency measured in terms of better prices to the producers, lower marketing charges and adequate availability of market amenities/facilities, is found to be relatively better in the regulated market. The study suggests the need for 25 imparting training in grading and standardization to the staff of the regulated market for efficiently integrating the market function and functionaries.

Based on all these, the research objectives targeted in this study are: to analyze the relationship between Agricultural extension service delivery and the marketing of agricultural product in Mezam Division, North West Region and to discuss the relationship between agricultural extension service and Marketing of agricultural product by

gender of household head in Mezam Division, North West Region.

RELATED LITERATURE

The benefits to farmers by sale of agricultural produce in the regulated market varies from area to area because of the variation in the spread of regulated markets over the regions and the existence of necessary infrastructural amenities/ facilities in these regulated markets (MoFA, 2017). Information and communication technology solution in agriculture marketing helps to evaluate plan, deploy impactful interventions to facilitate smallholder marketing (World Bank, 2008). Retail marketing of agriculture commodities through initiatives made by multinational companies did not attempt to explain how extension services to farmers are linked to information technology License for Electronic Spot Exchange has also been granted to National Spot Exchange Ltd and National Agriculture Produce Marketing Committee of India Ltd as spot exchange helps to remove intermediaries (Ndalama et al., 2015). Agricultural marketing functionaries, marketing of agriculture produce, importance of agriculture produce (Rivera, 2014).

Few prominent private sector organizations adopted different models for agricultural Marketing (MoFA, 2017).Telephone is used as means of communication for marketing of produce in India. Number of mobile enable services is addressing the information needs of the stakeholders to some extent (Singh et al., 2014). Experience and the potential of agribusiness franchising of commodities in India is growing at a rapid extent and the interest among the people for agro startups is more (Singh et al., 2014). The scope of Indian agriculture marketing systems, major private sector initiatives are reviewed (Makapela, 2015). Market-led Extension focuses on enhancement of knowledge, awareness

and skills of different stakeholders of the sector on different aspects of marketing aspects of agricultural produce besides those relating to their production. The farmer, after all, has to know what to produce as per the demand, where to sell, when to sell, whom to sell his produce etc. Hence, it is incumbent on the extension functionaries to go beyond seed, soil and fertilizer and also disseminate knowledge on marketing aspects such as grading, standardization, packaging, labelling, storage, transportation, market intelligence, wholesaling, retailing and modern tools of marketing such as contract farming, terminal markets, futures markets etc.

The farmer has to be empowered to avail himself of the different modes of price discovery mechanism to his advantage. The agricultural extension system in India is production-focused, relegating the marketing issues to the backburner. As market-driven production is the need of the hour, the extension system has got to be made market-led. In order to make the extension system fully market-led, at the outset, focus has to be laid on agricultural marketing extension system and its contents. A typical production-based extension system promotes good agricultural practices by enhancing knowledge, awareness, and skill level of the stakeholders on production aspects such as soil, water, fertilizer, seeds, planting material, agronomical practices etc.

On the other hand, agricultural marketing extension has to focus on disseminating knowledge, awareness and skill level of the stakeholders on different marketing aspects such as grading, standardization, packaging, storage, transportation, agricultural marketing finance, regulated marketing system, wholesaling, retailing, alternative marketing system etc. In order to strengthen and develop agricultural marketing system in the country, efforts in the area of training and extension have to be made at three levels. At policy level, it is necessary to formulate an

effective policy on agricultural marketing under which various components of marketing programmes and activities can be integrated and coordinated. At managerial level, the managerial and technical capabilities of those technical institutions involved in the implementation of the marketing policy need to be improved to enable them to deliver more efficiently and economically (Anderson, 2007).

At farm level, marketing extension should assist farmers in improving marketing skills, thereby helping them get remunerative prices for their produce. As the days of the mass production and mass marketing are now being replaced by customer-based or market-driven strategies, an effective marketing extension service is the need of the hour. This has added significance in the light of post-two scenario. If the Indian farmers have to withstand the possible onslaught of international competitors, both in domestic as well as overseas markets, marketing extension would be an effective instrument to safeguard farmers' interest through proper education and guidance on regular basis. The marketing extension service to assist small and marginal farmers in solving the problems faced in marketing their produce is, therefore, a sine-qua-non in the free trade environment (Jain, 1998).

Agriculture is the vital industrious area in a number of developing nations, in terms of its portion of the Gross Domestic Product and almost always in terms of the number of people it employs. In countries where the share of agriculture in overall employment is large, broad-based growth in agricultural incomes is essential to stimulate growth in the overall economy, including the non-farming sectors selling to rural people (Rivera, 2014). Research has shown that every dollar of growth from agricultural products sold outside the local area in poor African countries leads to a second dollar of local rural growth 3 from additional spending on services, local manufacturing, construction materials and prepared foods (Makapela, 2015).

METHODOLOGY

The study was carried out in Mezam Division of the North West Region. Mezam Division is located between latitudes 5°40' and 7°50'North and longitudes 9°80' and 11°51' east of the Greenwish Meridian (World Bank, 2008); with a total surface area of 1,841.45 km with a total population of 524, 127 inhabitants in the 2017 census. The agricultural population is estimated at 258,467 inhabitants representing 43.07% of farm families (World Bank, 2008). This population belongs to a large set of Ethnic groups, made up of several tribes such Ngemba (Awings, Mankons, Bafuts, Nkwens, Pignins, Akums, Njongs), Mugahkah (Bali), Bei (Baba IIs, Bafochus). Rainfall is the condensation of water vapor in the atmosphere due to the drop of temperature. The hottest month ranges from December to February with a maximum average daily temperature of about 30^{o} the average monthly rain fall is estimated at about 273mm .the raining season last for about 8months and the dry season for about 4months. The combination of this factors favor diverse agriculture in this area. The maximum rainfall is register during the month of august.an the minimum is registered in the month of January. The soil profile comprise of the sandy top layer, this area is bless with two type of soils which lateritic and hydromorphic soils. With regard to the lateritic soil, it is sub-divided into three group which are downstream, moderately and organic soils.

The region is also characterized by the convergence of many river flowing down from the mountains and come to the accumulation zones. The multiplicity of the river system in the region is of considerable benefit to the development of farming activities even in the dry season It has the savanna type of vegetation with grasses and trees scattered all over the village especially where there are steep slopes . Agro forest trees like tephorорsia, acacia and caliandra are planted by farmers. These are leguminous tress

which help in soil fertility. The village look like a forest zone at a glance the population is distributed with many villages within their boundaries corresponding to tradition chiefdom. Customary lawremain the primary means of land acquisition. There is the predominant of the young population of the areawhich is the major asset for potential agricultural production and development in the region. The chief crop produce in the zone are maize,Irish potatoes, beans, groundnuts, soya beans, tomatoes and cocoyam are the chief crop of people in this division.the diet of the people consist of rice, achu, Irish corn fufu accompany by vegetable, meat or dry fish.(FAOSTAT, 2014)

Agriculture is the main occupation of the people of this area and crop production is very valid. Current crops are rice, maize, beans, tubers and vegetable crops, onion, Irish. There is equally the present of fruit trees and medicinal plants are found in this locality. These crop are used only for consumption and only surplus is sold in the local market and in neighboring or distance places. Onion production is one of the main crop cultivated by the population of this subdivision and it is therefore one of the main source of income since it is mostly cultivated for sell. Farmers in this area also engage in life stock production and cattle rearing (FAOSTAT, 2014).

Data Setting

The study being quantitative made use of a structured questionnaire and data was collected from 200 farmers. The questionnaire will be divided into two parts. Part A dealt with the farmers' personal information while part B was focus on specific issues in the study. Primary data was obtained from respondents who are Key informants through face to face interview. Key informants included agricultural extension workers, ward executive officers and questionnaire to farmers. This method was appropriate to obtain primary data due to the socio-economic and

demographic characteristics of the study population. Jain (1998) has shown education level, age structure, socioeconomic structure and ethnic background as important things to consider when making a decision leading to primary data collection method. Information base on secondary source of data were based on research literature comprised of researching the internet, reviewing relevant books, journals articles about the research topic to get information and concept related to the topic.

The sample was drawn through simple random sampling methods. The simple random sampling technique was used to select the respondents making a total of 200 farmers for the study. This sampling technique is preferable because all the elements in the population had equal chances of being selected and included in the study without bias. In this study, simple random sampling was used to obtain a sample of household's producers. Through this technique each household in the population was given equal and independent chance of selection in the sample (Jain, 1998).

Data processing involved; coding, editing and classification. Data was edited first to check for errors before beginning data entry. Then the data were assigned codes. Editing was done to check if data were accurate and consistent, while coding means assigning numerals to answers so that responses are put into limited number of categories and classes. Processing of data was focused on the preparation of frequencies, tables, graphs, charts or pictographs. Data is analyzed using MS-Excel and the SPSS version 20 software programs so as to determine the descriptive statistics such as percentages and frequencies of study variables. Qualitative data and information from personal interviews were grouped according to emerging issues and themes in the study.

Model Specification

Agricultural extension service is an appropriate framework for measuring marketing of agricultural products as condition by extension services, thus modeling econometrically the effects of Agricultural extension on marketing in Mezam division, we apply the following equation of interest:

$$M_i = \Phi + \lambda ES_{agric} + \psi\pi_i + \varepsilon_i \quad (1)$$

Where PM_i is agricultural production and marketing of agricultural products which are our outcome variable of interest; ES_{agric} is simply Agricultural extension service; π_i represent a vector of exogenous demographics of maternal, paternal and environmental characteristics while i is the unit of observation of agricultural production and marketing of agricultural products in Mezam division. In the econometric, λ portrays the actual effect of Agricultural extension service on agricultural production and marketing of agricultural products. In addition, Φ, ψ are parameters to be estimated, while ε is the error term respectively. Given that there can be some biases due to omitted variables, it will be possible that the covariance of ES_{agric} and the error term (ε) is not equal to zero, hence making our result inconsistent. To redress this situation, we identify an instrument variable M, the instrument is a factor that affects women participation in agricultural production and marketing of agricultural products without directly influencing population growth and food security, in other words it's a variable that can partially determines women participation in agricultural production but is uncorrelated with the error term. The population growth and food security generating function may take the following structural form:

$$ES_{agric}=\Phi_{PF}+\hat{\lambda}_{PF}FES_i+\gamma_{PF}\pi_i+\mu_i \quad (2)$$

The instrument use in our study is log of size of rice farm, with such an instrument; we can estimate a two stage regression model with the first stage equation as indicated in equation (2) above. As indicated in the literature, the consistency of the estimate of $\hat{\lambda}$ relies on the validity of the log of rice farm as our instrument. Thus, as *FPR* (Farmers Place of Resident) and *FES* (Frequency of extension service visit) are uncorrelated with ε, then the instrumental variable estimate of $\hat{\lambda}$ is consistent. Morrill noted that this is fundamentally an untestable assumption. Everything being equal, our model can be estimated by taking the predicted value of agricultural extension service from equation (2) and substituting it in for agricultural production in equation (1) in an IV 2SLS model. Based on the introduction of instrumental variables, it has already been mentioned that three properties of an instrument that need to be noted at the outset: (i) an instrument is relevant if its effect on a potentially endogenous explanatory variable is statistically significant, (ii) an instrument is strong, if the size of its effect is 'large' and (iii) the instrument is exogenous if it is uncorrelated with the structural error term. An instrumental variable that meets all these requirements is a valid instrument.

Endogeneity can arise due to: errors-in-variables, omitted variables and simultaneous causality (Tambi, 2014). Endogeneity bias can compromise the validity of OLS estimators. The IV approach is intended to oxygenize the endogenous regressors using valid, relevant and strong instruments and the most commonly used IV estimation method is the single equation approach of two-stage least squares (2SLS) estimators. As a strategy for supporting instrument validity, that is we test over-identifying restrictions using Sargan's test statistic (nR^2) which has a

chi-square distribution with degrees of freedom equal to (*l*-*q*), the degree of over-identification (where *n* is the sample size, R^2 is from first-stage regression showing the strength of the instrumental variable, *l* is the number of IVs and q is the number of endogenous variables). This test the null hypothesis that all instruments are valid, hence failing to reject signifies instrument validity. The bias of 2SLS approach grows with the number of IVs (*l*), declines as sample size (*n*) rises and as the strength of the IVs (R^2) increases. Thus, as long as nR^2 is larger than *l*, (which will often hold true if the instruments are strong), 2SLS has smaller bias than OLS.

Considering the reduce form estimate, we remark that the 2SLS estimate of M can also be thought of as resulting from the division of the reduced form estimate $\hat{\lambda}_{PF}$ below, by the first-stage coefficient derived above FPR_{PF} and FES_{PF}. The reduced form equation is the regression of agricultural production and marketing outcome on the instrument: This actually indicates whether the instrument is correlated with the outcome of interest.

$$M_i = \Phi_{PF} + \hat{\lambda}_{PF} FES_i + \gamma_{PF} \pi_i + \sigma_i \quad (3)$$

In evaluating our endogenous variable, the 2SLS estimate is a reasonable estimation strategy with limited dependent variables and a dichotomous endogenous variable. Since our variables of interest are all continuous variables with a dichotomous endogenous variable, this make our model of instrumental variable robust in terms of estimations.

RESULTS

Socioeconomic Characteristic of Farmers in Mezam

As seen in Table 1, the aspect of education is considered important since inadequate knowledge is a

challenge to production strategy. The level of education an individual person has may contribute to one's ability to produce more. It was revealed that some of the respondents (45.5%) have acquired primary education; this can make the learning environment bad as it can be difficult for them to receive new agricultural knowledge and skills. Others, 33% of the respondents have secondary education and those with tertiary education make only15%. This implies that a majority of the population do not go beyond primary education.

Education level attained by the population can lead to positive or negative effects upon production hence contributing to poverty reduction in the study area. The low level of education of the farmers might greatly affect the production because some scientific methods are also needed in production wish can only be study in the class room. In addition, some chemical might have some effect on the crop which the farmers cannot easily identify due to their low level of education. Jain (1998), revealed that universal primary education, The eradication of illiteracy and the attainment of a level of tertiary education and training commensurate with a critical mass of high quality human resources required to effectively respond and master the development challenges at all levels. The survey revealed that there were more male farmers (55%) in the division than female farmers (45%). The figure therefore indicates that extension services provision in the division are being accessed by both sexes but the proportion of the total male farmers benefiting from the intervention in the division (32%) is low and not encourage.

Table 1 Socioeconomic Characteristic of Farmers in Mezam

Description	Frequency	Percent
Distribution of Farmers according to the Level of Education		
Primary	91	45.5
Secondary	66	33.0
Tertiary	30	15.0
Others	13	6.5
Distribution according to Gender of the Farmers		
Male		55
Female		35
Distribution according to the Household Size		
< 5 family members	33	16.5
5-7 family members	90	45.0
>7 family members	77	38.5
Distribution of farmers according to their age group		
< 20 years	36	18
20 -45 years	64	32
>45 years	100	50

Source: Author

Family size is a very important sociological variable in agricultural systems. Families with more household members tend to have more labor which increases their production. The survey indicates that 45 percent of the respondents in the division have a family size between 5 to 7 persons and 38.5 percent with a family size of 7 persons and above. This implies that, 83.5% of the respondent keep large number of persons in their households from 5 persons and above and very few (16.5%) of the respondent a normal family size of below 5 persons. The number of persons in the

households of the study area is represented in figure 2 it can be inferred from the table that large number of the respondents kept large family. This might imply that majority of the farmers are likely to experience high dependency burden thereby affecting their savings and consequently raise low capital. Family size is a very important sociological variable in agricultural systems. Families with more household members tend to have more labor which increases their production. Result from my analysis shows that, 16.5% of the household size was regarded as small size with less than 5 persons per family meanwhile 45.0%was consider as medium with five to ten person per family. This shows that the household size is an important instrument for production. Only 38.5% of my respondent has more than 10 members in their family.

The analysis of respondents' age simply aimed at looking at the involvement of different age groups in agricultural production. This study showed that agriculture is practiced by all age groups however the majority (82 percent) of farmers were within the age ranging from 20 years and above. Other farmers with the age below 20 years comprise only 18 percent because most of them engaged in schooling due to school going age they have. These findings are in contrast to the existing complaints that majority of youth and middle aged people do not prefer to participate in agriculture as their income generating activity. Findings revealed further that there is enough involvement of youth who can take responsibilities of production and marketing efficiently and effectively since they are active working group of the society. Therefore, agriculture is a potential activity in reducing poverty. Age is a very important aspect in farming base on the physical abilities of the person. This means that only the able bodied and members of the society are expected to fully engage in farming activities.

Relationship between Extension Services and Agricultural Marketing

Table 2 present the result of (a) the OLS result on column two which can either be bias upward or downward; (b) the instrumental variable result in column three (IV 2SLS); considering equation one above, the result of the OLS regression can either be biased upward or downward depending on the direction of the relationship between agricultural extension and agricultural marketing.

Therefore, this OLS result is not appropriate for inference. This explains why agricultural extension service is negatively significant revealing that the value of agricultural extension services is not appropriate for judgment. The 2SLS result solves the problem of endogeneity resulting from the data which can either be from missing variable or omission. Going by 2SLS result presented above, extension service positively contributes to agricultural marketing. That is the more individual seek for the services of extension agents, the more they are likely to increase their investment and hence increase their wealth status thereby resulting to an increase in the standard of living which is as a result of the increase of agricultural marketing. This coefficient is statistically significant at 1% level of significant indicating that agricultural extension activities is a significant determinant of agricultural marketing

Table 2: Relationship between Extension Services and Agricultural Marketing

Variable	**Reduced Form**	**Estimation Methods: 2SLS**	
	Extension Service	**OLS**	**2SLS**
		Agricultural Marketing	
Agricultural Extension Service	n/a	-3.839*** (-16.055)	0.759*** (3.09)
Frequency of extension visit	0.454*** (6.15)	n/a	n/a
Training in agriculture	0.145*** (8.87)	-0.125 (-1.603)	0.963** (2.08)
educational level	-0.298*** (8.93)	-0.026 (-.706)	0.233 (2.50)
family size	-0.092*** (40.23)	-0.072 (-1.577)	-0.370 (0.28)
Farmers place of resident	0.000** (2.09)	1.704*** (9.249)	0.936** (2.17)
Fertilizer in your farm	0.333*** (14.15)	-2.204*** (-6.160)	-0.370 (0.28)
Climate change effect	0.664*** (16.15)	-4.746*** (-7.231)	-0.962 (1.67)
Access to credit	1.159*** (26.69)	0.525** (3.008)	0.109 (1.79)
Prices effects	-0.295*** (8.68)	-1.740*** (-5.345)	0.233* * (2.45)
Difficulties consulting extension agent	0.209*** (8.77)	0.753*** (4.475)	-0.384 (0.73)
Transporting cost	0.117*** (7.09)	-2.057 (-6.185)	-0.208 (0.44)
Market information	-0.092*** (40.22)	-.603** (-3.502)	0.359 (3.72)

Table 2, continued			
Treatment	-0.000* (1.79)	-0.110 (-.328)	0.678* (1.70)
Constant	0.332*** (13.99)	17.208 (17.136)	0.128 (5.21)
R – Squared	0.7062	0.7974	0.5251
Wald χ^2 (*p*-value)/ F-Stat [df; p-val]	72.24 [13, 11377; 0.0000]	46.129 [13; 0.000]	479.47 [12, 11378; 0.0000]
F test of excluded instruments/ Joint F / χ^2 (p-value) test	n/a	n/a	15.98 [2, 11377; 0.0000]
Angrist-Pischke multivariate F test	n/a	n/a	31.902 [0.0000]
Sargan statistic test	n/a	n/a	15.918 (0.0001)
Cragg-Donald F-Stat	n/a	n/a	15.976 [19.93]
Durbin-Wu-Hausman χ^2 test	n/a	n/a	34.913 (0.0000)
Total Observation	200		

Source; Author from field survey. Notes, ***, **, and * indicate 1%, 5%, and 10% level of significance respectively

With regard to the table above, it was noticed that, extension services play a very important rule in the marketing of agricultural products. This is shown by it statistical significant level of 1%.

Thus farmers who take extension services serious has a greater probability of having a greater share of the

market. More so the coefficient for access to credit is positive (0.525, showing that there exist a positive relationship between access to credit and agricultural marketing. If the farmer has the ability to always sick for credit in financial institution in the form of loans and grants in order to add to his capital, it will help him to boost his agricultural marketing. Increase in capital leads to increase in products purchase hence, increase in income and revenue. Access to credit is statistically significant at 5% level of significant.

In another direction, family size and educational level have no influence on agricultural marketing. They have a negative coefficient of (-0.026) and (-0.072) respectively. The negative coefficient for educational level indicates that agricultural marking does not rely on educational level. Extension services can be done to everybody willing to learn. It also apply to the family size. Marking of agricultural products does not depend on how large a family is but how skillful it is. Frequencies which are measure by the number of times an extension agent visit a farmer affect agricultural marketing positively. It has a positive coefficient of 1.704 which shows that frequent visiting of the farmer influence marketing. It is also significant at 1% level of significant. This shows that marketing activities tends to increase due to how often the farmer receives training.

Climate change has a statistical significant level of 1% level of significant. Indicating that, rainfall, sunshine, poor or good weather condition has a great effect as far agricultural marking is concern. Hence a good weather condition will have a positive influence on agricultural marketing. The adjusted R-squared which shows the degree of goodness of fit has a coefficient of 0.7824 implying that about 78% variation in agricultural production is accounted for by changes in the explanatory variable included in the model. To verify for the joint significant effect of the explanatory variables on the dependent variables, the F-

statistics test is used. The coefficient of the F-statistics is significant at 1% level of significance indicating that the explanatory variables jointly are significant determinant of agricultural marketing.

Implications of Extension Services on Marketing by Gender of the Farmer

With regard to the Table 3, it can be noticed that, women seeks more extension services in the marketing of agricultural products more than men. This is seen from the statistical significant level of 5% for women and 10% for men. Statistical level for men involve in marketing is 1% and for women is 10%. Thus farmers who take extension services serious has a greater probability of having a greater share of the market.

More so the coefficient for access to credit is positive for both men and women with a statistical significant level of 10% each, showing that there exist a positive relationship between access to credit and marketing for gender. If the farmer have the ability to always sick for credit in financial institution in the form of loans and grants in order to add to their capital, it will help them to boost his agricultural marketing. Increase in capital leads to increase in products purchase hence, increase in income and revenue. Access to credit is statistically significant at 10% level of significant. Frequency which is measure by the number of times an extension agent visit a farmer affect agricultural marketing positively. It has a positive coefficient of 1.704 which shows that frequent visiting of the farmer influence marketing. It is also significant at1% level of significant. This show that marketing activities tends to increase due to how often the farmer receive training. Climate change has a statistical significant level of 1% level of significant. Indicating that, rainfall, sunshine, poor or good weather condition has a great effect as far agricultural marking is concern.

Table 3 Extension Services and Marketing by Gender of Farmer

	Estimation Method: IV 2SLS	
Variable	**Male**	**Female**
	Agricultural Marketing	
Extension Service	0.081* (1.70)	0.005** (2.32)
Training in agriculture	0.237*** (3.63)	0.115*** (3.06)
educational level	-0.238*** (-6.94)	-0.009*** (-5.27)
family size	0.039*** (5.37)	0.001*** (4.93)
Frequency of extension visit	-0.008 (-1.80)	-0.2261 (-1.28)
Fertilizer in your farm	0.0355 (0.97)	0.0612 (0.72)
Climate change effect	0.120 (0.73)	-0.082* (1.65)
Access to credit	0.620*** (7.73)	-0.067*** (-4.85)
Prices effects	0.027 (0.61)	-0.016*** (-5.42)
Difficulties consulting extension agent	0.212*** (4.93)	0.111*** (6.48)
Transporting cost	0.592 (0.17)	-0.141*** (3.20)
Market information	0.973*** (5.88)	0.062*** (3.18)
Treatment	-0.020* (-1.91)	0.015 (0.08)
Constant	0.377*** (11.17)	0.005** (2.32)
R – Squared	0.6256	0.5811
F-Stat [df; p-val]	19.11 [11; 0.0000]	13[11;0.000]
Total Observation	**110**	**90**

Source: Author from field survey. Note, ***, **, and * indicate 1%, 5%, and 10% level of significance respectively

CONCLUSION

The main aim of this study was to examine the influence of agricultural extension services on marketing. The source of information was primary data collected from a sample of 200 farmers of which fifty farmers were was picked from each council area. Quantitative, correlation and regression analysis were used to analyze data collected. The findings reveal that, agricultural training, education and the frequency of extension agent visiting a farmer are having a positive significant influence on marketing. This therefore implies that the more a farmer is well trained and educated, the more his marketing consciousness this is simply because, there are some techniques involve in production that every farmer need to be train on how to go about doing it. Furthermore, access to credit was found to be positively associated to the level of agricultural marketing. Hence, as farmers market much product their income also increases leading to increases social wellbeing and living standard. Also, if there are more persons in a household, labour is distributive among them and production increases. This explain why many people makes work easier.

Difficulties consulting extension agent, climate change, transportation cost due to bad farms to markets roads, were found to have negative significant effects on agricultural production and marketing. As the farmers finds it difficult to see an extension agent, the less they will produce since there is a risk of producing much of what they are not sure of harvesting in good measures with respect to the input. More so, the cost of transportation is a big problem especially in our Cameroon. This is because of bad farm to market roads as a result, farmers finds it difficult to produce more because it might remain in the farms. And again, climate change has become a major issues since production of some particular croups are cultivated only in some season making it scares in the market.

Furthermore insufficient storage space, occurrence of natural disaster, pest, diseases and fungi threat also has negatives effect on agricultural production. Famer having insufficient storage space will find it difficult to product in a large quantity because they will be force to mismanage some or sell at very low price hence reducing their living started. In addition, pest, diseases and fungi are a major thread to some farmers. This will cost them so much during production hence, there will prefer to produce less in other to properly manage it. In addition to that, natural disaster such as earthquake, landslips and wild fire has proven to have a negative significant on production. Farmers find it difficult to cultivate in some area though with availability of vast land. This will make some of the farmers to limit their scope of production hence limiting the amount of crop product and limiting their income level. In addition, market information is a very important factor as far as agricultural marketing is concern. From the analysis, it was proven that access to market information make agricultural marketers to know where to produce or buy more or less. This is because a produce/ buyer might produce/buy more goods while there is no market for it hence, encoring a lot of losses. On the other hand a producer\buyer might produce\buy less where there is a market for the product. So, market information is a very important factor in both production and marketing.

Based on the findings and conclusions, farmers are also encourage to always seek for market information before engaging in production and marketing activities, this will help them to master the market and know which a quantity to produce at a given season. More so, it was discover during the findings that, most farmers do not have access to credit and so the level of investment becomes very law further leading to law income. So farmer should ask for agricultural loans in financial institutions and invest in the farm business. They should always visit a agricultural institutions such as ACEFA and seek for financial assistance and training.

REFERENCES

Anderson JR (2007). Agricultural Advisory Services. Background Paper for the World Development Report 2008. P. 44.

Assuming, B. S. et al (2018). Institutional Bottlenecks of Agricultural Sector Development: The Case of Research and Extension Provision in Ghana. Accra, ISSER.

Alex, G., D. Byerlee, M. Helene-Collion,andW. Rivera (2004). Extension and Rural Development: Converging Views on Institutional Approaches? Agriculture and Rural Development Discussion Paper 4, The World Bank, Washington, DC

Boko M. I., Niang A., Nyong C., Vogel A., Githeko M., Medany B., Osm an-Elasha R., Tabo Y. and Yanda P., (2017). Africa Climate Change: Impacts, Adaptation and Vulnerability; Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge UK, 7: 433-467.

Courade, G. and V. Alary (2007), "De la Libéralisation à la Dévaluation: Les Planteurs Attendent leur Réévaluation", pp. 184–203 in G. Courade (ed.), Le Village Camerounais à l'Heure de l'Ajustement, Paris: Karthala.

Fritschel, H. (2013). Will supermarkets be super for small farmers? IFPRI Forum, December 2003. Washington, D.C: International Food Policy Research Institute

FAOSTAT. (2014). All longitudinal production and population data. Retrieved September 4, 2006, from http://faostat.fao.org/

Janin, P. (2014), "Un Planteur sans État Peut-il Encore Etre un Planteur?", Politique Africaine, 62: 45–56.

Makapela (2015). Effectiveness of agricultural extension organization in rural areas: the case of Amathole District Municipality (Eastern Cape). University of South Africa, Pretoria.

Moni M, 2016. Ushering market-led agriculture extension. Available at http://www.i4donline.net

MoFA (2017). Food and Agriculture Sector Development Policy: FASDEP II. Accra, Statistical, Research and Information Directorate

Ndalama E, Kamanga-Thole G, Missanja E (2015) Agroforestry contribution to the improvement of rural community livelihoods in Balaka, Malawi. *International Journal of Forestry and Horticulture* 1(1): 5-11.

Ndoye, O. and D. Kaimowitz (2010), "Macro-economics, Markets, and the Humid Forest Cover of Cameroon, 1967–1997", Journal of Modern African Studies 38(02): 225-53

Rivera W.M. 2014. The Invisible Frontier: the Current Limits of Decentralization and Privatization in the Developing Countries. In F. Brewer (Ed.), *Agricultural*

Singh, J. P., Swanson, B. E., & Singh, K. M. (2006). Developing a decentralized, market-driven extension system in India: The ATMA model. In A. W. van den Ban, & R. K. Samanta (Eds.), Changing Roles of Agricultural Extension in Asian Nations. Delhi: B. R. Publishing

Swanson, B. E., Samy, M. M., & Sofranko, A. J. (2011). The new agricultural economy: Implications for extension programs. In J. E. Christiansen, J. R. Linder, & G. J. Wingenbach (Eds.), Proceedings of the 19th Annual Meeting of the Association for *International Agricultural and Extension Education* (pp. 641-647).

Waddington, H. (2010). The Impact of Agricultural Extension Services. Washington D. C.,

Tambi DM (2014). Modelling the effects of Mother's age at first birth on Child health at Birth. *Asian Journal of Economic Modeling*, 2014, 2(1), 1-17

World Bank (2008), World Development Indicators 2008, Washington DC: World Bank. http://devdata.worldbank.org/data-query.