The Effect of Agricultural Policies on Farm Production in Benue Division, North Region of Cameroon.

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ABSTRACT

The main objective of this study is to determine the effect of government agricultural policies on farm production in the Benue division in the Northern region of Cameroon. Data was collected from 399 respondents using a self-administered questionnaire through a stratified sampling technique of 12 sub-divisions in the Benue division. We adopted a binary logistic regression estimation technique to estimate the model. The empirical results of the binary logistic model for the overall sample revealed that Government extension and advisory services (GEAS) have a positive effect on farm production. Specifically, increasing GEAS in the Benue division will lead to a 0.09419 increase in farm production and it is significant at a 5% level of significant. Government agricultural infrastructure (GAIF), a unit increase in GAIF, will lead to a 0.3790 increase in farm production in the Benue division and it is significant at a 10% level of significance. The last significant government agricultural policy on farm production is the government agricultural financial policy (GAFP). The result revealed that an increase or improvement of GAFP in the Benue division, will increase farm production by 0.3366 and it is significant at a 5% level of significant. Meanwhile, government agricultural climate policy has an insignificant effect on farm production. In this light, there is a need for the government to train and deploy more extension workers in the various sub-divisions and communities in Benue division, to increase farmers' access to these services. This can be done by giving specific skills on how to produce dominant food crops and livestock in the Benue division through workshops and seminars.

Key Words; Government Agricultural Policy, Farm Production, Benue Division, and North Cameroon.

INTRODUCTION

Agricultural productivity is the core objective of governments, international development discourses, and policies. This is particularly evident in the extent to which the world has gone to improve farm yield. Firstly, the Green Revelation was a set of research and technology transfer initiatives occurring between the 1950s and late 1960s, championed by the Ford and Rockefeller Foundation and supported by the United Nations, food and Agricultural Organization (FAO) (FAO, 2004), for example increased agricultural production in parts of the world as well as reduced poverty in many parts of Asia and Latin America countries during the 1960s -1990, though the transfers of the same strategies to Sub-Sahara Africa had limited success due in part, to locally unsuitable seed varieties and a lack of human and institutional capacity (Dawson et al., 2016).

Meeting the growing demand for food security in developing countries is one of the biggest challenges nowadays. At a time when the world is clamoring for food safety, most developing countries still depend on the importation of food for local consumption. Most farmers, especially the smallholder farmers in Africa, tend to face some challenges in the process of production and this has played a big role in affecting their productivity. One of the reasons for low productivity is that only a small number of farmers interact with public extension agents and the farmers with smaller farms have less access to extension services

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(Magdalena, 2015). Magdalena also added that government agricultural policy in terms of agricultural extension and rural advisory services are the priority areas of closing the gap between actual and potential productivity, increasing labor productivity, improving farmers' management skills, ensuring widespread adoption of more sustainable agricultural practices, and supporting rural livelihoods. FAO projects aim at increasing agricultural output by at least 60 % globally, and 100 % in developing countries (FAO, 2014). Hence, a lot is expected from extension and advisory services to boost farmers' productivity and their livelihood in developing countries.

To remedy the situation of low production of farmers, especially that of the small-scale farmers who constitute a majority in carrying out agricultural activities in most developing countries of which Cameroon is not excluded, extension and advisory services were put in place by the government to check these lapses in production and also to improve on farmers' livelihood (Kristin, 2018, Yeyoung *et al,* 2017). Even though in many developing countries, extension and advisory services have long been recognized as an important factor in promoting agricultural development, most farmers still experience low productivity, (Anderson *et al,* 2007). Nevertheless, from a development-policy perspective, the investment in extension services or the facilitation of non-government extension are potentially important tools for improving agricultural productivity and increasing farmers' incomes. Also, advisory services can play an important role in meeting the new challenges agriculture is confronted with: changes in the global food and agricultural system, including the rise of supermarkets and the growing importance of standards and health problems that affect rural livelihoods; the deterioration of the natural resource base and the emerging need to cope with climate change (Anderson, 2007).

Above all, the agricultural sector forms the backbone for most economies in the world – most especially African economies (Banda, 2020, & Mohammed, 2018). According to Goedde et al., (2019), more than 60% of the population of Sub-Saharan Africa is involved in agriculture and about 23% of African GDP comes from agriculture. The majority of those involved in agriculture in Africa are small and medium-scale farmers (Glover et al., 2019 & Jayne et al., 2019), who according to Mukasa et al. (2017) are based on subsistence farming, which is unable to generate sufficient surplus cash to purchase modern tools and machinery as a result. majority of most African countries are faced with extreme poverty i.e., they earn less than $1.90 (€1.64) a day for example an estimated 413 million people in Africa currently live in extreme poverty more than half of the world's total (Müller-Jung, 2018).

Given that the bulk of the poor are in rural areas, and are employed in agriculture, Sarris et al., (2016) posit that agricultural and food policies have a crucial role in reducing rural as well as aggregate poverty in Africa, including Cameroon and crucial among these policies are those that help increase incomes of the rural poor. In the same vein, FAO (2021) suggests that Africa will also need to improve the policy and regulatory framework for agriculture to make it more supportive of both local community participation in rural areas and commercial private sector operations. It will need to improve governance, in terms of giving a voice to both small and large-scale players in the farming community. Hence, the role of government agricultural policies mostly initiated by the government, cannot be overstated if the full potential of its citizens has to be tapped which of course will go a long way to increasing productivity and eradicating poverty.

Furthermore, it is no doubt that much has been done by the governments of developing nations including Cameroon in the domain of agriculture to boost farm productivity. For example, Cameroon has through its agricultural institutions like the Ministry of Agriculture and Rural Development, IRAD, instituted key agricultural policies in diverse domains among which include agricultural research and extension services, (G-FRAS, 2021; Ngomi et al., 2019), climate change (Manila, 2019), financial services (Business in Cameroon, 2021) and other services like the provision of farm to market roads, marketing of agricultural output and provision of input (MINADER, 2019; Amabo, 2019; Cameroon report, 2020). Nevertheless, according to Von Grebmer et al., (2017), Cameroon has a Global Hunger Index GHI) score value of 12.6,

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reflecting a serious level of hunger. This indicates that Cameroon's commitment to research and development in the agricultural and food sector is not sufficient, (Fontan *et al.,* 2019). This is also in line with (Bethuel *et al*, 2017, & Eneji *et al.*, 2012) who equally revealed that, African agriculture is characterized by low productivity and that there is a lot to be done by the government in terms of inadequate agricultural policies to improve on the situation at hand.

In general, many researchers have researched so far on agriculture and poverty reduction for example (Bekun, & Akadiri, 2019; Achancho, 2013; Irz et al., 2001), but only a few have written on government agricultural policies e.g., Achancho (2013). Besides, only a few have written on government agricultural policy and its role in farm production especially in Cameroon. It is based on this background, that this paper seeks to examine the role of government agricultural policies on farm production in Cameroon in the North Region and to be more precise, Benue Division.

REVIEW OF RELATED LITERATURE

Egwu, (2016) examined the impact of agricultural financing on agricultural output, economic growth, and poverty alleviation in Nigeria using the ordinary least square regression technique and the findings revealed that Commercial Bank Credit to Agricultural Sector (CBCA) and Agricultural Credit Guarantee Scheme Fund Loan to Nigeria's Agricultural sector (ACGSF) were significant to Agricultural sector output percentage to gross domestic product (ASOGDP) Hence, the dependent variable, thereby alleviated the poverty rate and induced to economic growth in Nigeria, that there exists a long run relationship among the variables in Nigeria under the study period.

Elias et al., (2013) in the same vein evaluate the effect of agricultural extension program participation on farm productivity by taking three case studies of kebeles (peasant associations) in Ethiopia. Primary data collected from 300 selected farm households, comprising of extension participants and non-participants, were used in the study and analyzed using Ordinary Least Square (OLS), the result shows that extension participation increases farm productivity by about 6%. In conclusion, the extension program had a positive effect on farm productivity in the study area. On the other hand, Ngomi et al., (2019) empirically studied the determinants of the adoption of agricultural extension services in the Centre region of Cameroon using a logistic regression model and results showed that years of education, farm size, income, distance to the nearest market and agricultural experience were the most significant determinants of adoption of agricultural extension service in Centre region of Cameroon. It is strongly advised that more emphasis be placed on the education of rural farmers' authorities or decision-makers to ensure widespread dissemination of this service to by competent boost farmers' productivity.

Machethe, (2004) points out that Access to agricultural support services remains a major factor constraining the growth of smallholder agriculture and that to achieve a broad-based smallholder agricultural productivity, it will be necessary to broaden the scope of the program to include smallholder farmers in the former homelands. Hence, suggests that while agriculture plays a major role in poverty alleviation, the poverty problem in South Africa cannot be solved by promoting smallholder agricultural growth alone. More attention should also be given to the promotion of nonfarm activities (e.g.agro-industry), particularly those that are linked to the smallholder agricultural sector.

Muindi, (2017) sought to find out how the Agricultural Sector Development Policy Strategy has affected agricultural productivity in Kenya focusing on Tana River County and the study concluded that climate change response, agribusiness, agricultural extension services, and access to agricultural credit positively and significantly influence agricultural productivity. Based on the research findings the study recommends that Tana River County should implement agricultural extension services.

Quiroga et al., (2017), combined a farm business panel dataset for 98 EU territories with a Stochastic

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Frontier Analysis (SFA) approach, to assess the impact of four contemporary broad categories of common agricultural policies (CAP) subsidy programs on efficiency and environmental sustainability. By the literature, this study more correctly defines inputs as "facilitating", whilst following recent methodological developments, crop subsidies are treated as an endogenous strategic variable in the production function. Comparing between two discrete periods, further tests are conducted to examine the hypothesis of technical efficiency convergence across European territories. The results suggest that first-pillar crop subsidies and pillar two environmental programs generate a disincentive effect on productivity, whilst in general, the CAP promotes technical efficiency convergence within Europe.

In a book chapter, Kumbhakar, & Lien., (2010) analyzed the impact of subsidy payments on farm production and efficiency. More knowledge about how farm productivity and efficiency are affected by subsidies could help policymakers introduce better-targeted agricultural policies. In almost all studies, subsidies are treated as exogenous. This chapter examined how subsidy payments influence farm productivity and technical efficiency when subsidies are treated as endogenous variables in productivity and inefficiency models. The study is based on unbalanced panel data from Norwegian grain farms during 1991–2006. Results show that subsidies negatively affected farm productivity but had a positive influence on technical efficiency.

Looga et al., (2018) analysed the relationship between land fragmentation and farm production. The results show that land fragmentation measured using the Januszewski index has a U-shape relationship to farm productivity: there are larger farms with many parcels that are productive, but their parcels are scattered, and smaller farms, with few parcels that are also productive. They found an indicator that describes the differences in farms' productivity based on their land use – the area-weighted mean size of the parcels of one farm. This indicator is a statistically significant determinant of farm productivity. Other significant variables that are related to higher productivity are farm owners' education, farm size, farming system, and production type. Agricultural land policies should consider multiple indicators and analyze different production types to intervene more effectively.

MATERIALS AND METHOD

Description of Study Site

The North Region makes up 66,090 km² of the Northern half of the republic of Cameroon with a population density of 37/km2. The region is surrounded by Far North to the north, Adamawa Region to the south, Nigeria to the west, Chad to the East, and Central Africa Republic to the southeast. The city of Giroux is both the political and industrial capital of the North Region and is the third largest port lying on the Benue River. The region has a population of 2,442,578 (City population, 2020) and is made up of four divisions and twenty subdivisions namely: Benue- Garoua 1, Garoua 2, Garoua 3, Bibemi, Pitoa, Lagdo, Dembo, Gashiga, Basheo, Barndake, Ngong and Touroua; Faro- Poli and Beka; MoyoLouti – Guider, Mayo-Oulo and Fiquil; Mayo Rey- Tchollerie, Touboro and Madingring The climate is tropical in North. In winter, there is much less rainfall than in summer. The Köppen-Geiger climate classification is Aw (Climate data, 2021). The average temperature in Garoua ranges from 26.0 °C (78.8 °F) in January to 33.0 °C (91.4 °F) in April. The region is made up of metamorphic and sedimentary rocks interspersed with granite. The Adamawa plateau divides the region into two main soil types; the Ferruginous soil and ferraliticor lateralitic soil.

Many of the North ethnic group's farm on small plots for subsistence. The majority of the crop they cultivate include sorghum, millet, and maize, which is their main staple foods throughout most of their provinces. Cassava is mostly cultivated in the Adamawa plateau while rice is popular in their cities. Cotton constitutes the major cash crop as it grows well in the North River valley and is managed by

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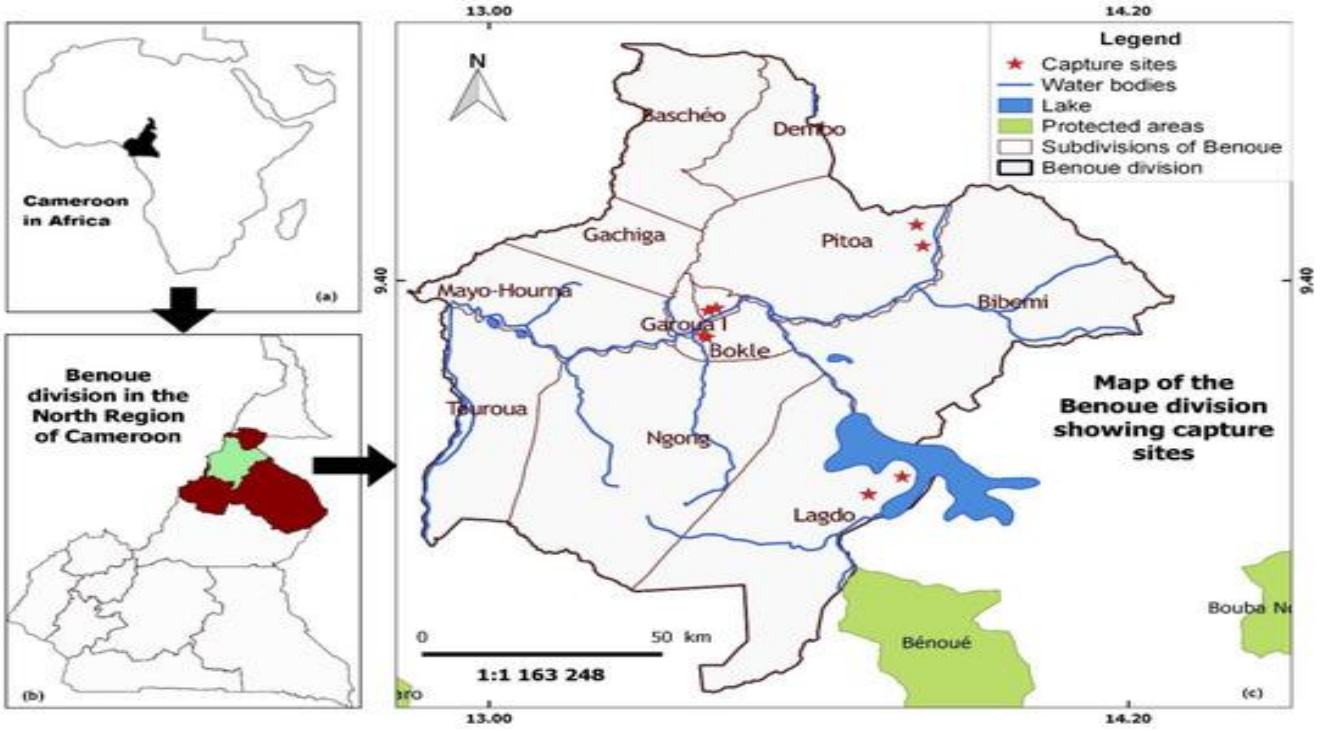
SODECOTTON. In respect to settlement, the region is mostly populated averaging 12 to 25 persons per km^2 in most areas.

Figure: Map of Benue Division



Source: **Melton and Baumann, (2010)**

Data Collection

The main population of this study is farmers living and farming in the Benue division in the North Region of Cameroon, in localities where they have benefited from some agricultural services arising from changes in government agricultural policies.

However, given the fact that Benue division is the biggest division with 11 subdivisions in the North Region of Cameroon, the target population shall be the farmers in Benue division of the North Region found in the following 11 subdivisions; Garoua 2, Garoua 3, Bibemi, Pitoa, Lagdo, Dembo, Gashiga, Basheo, Barndake, Ngong and Touroua.

In the context of this study, the sampling technique adopted was stratified sampling technique, where the population was divided into various strata (11 subdivisions of the Benue Division, North Region) and questionnaires were administered to the farmers in the various 11 sub-divisions.

The sample size is determined using Slovin, (1961) technique as thus,

$n= N/1+Ne^2$

where n= sample size N = sample population

e= standard error is 5%

The population of Benue division=1,247,369 inhabitants (City population, 2020)

Percentage of farmers =70%

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Sample population =70% *1,247,369 = 873,158

n= 873,158.3/1+873,158. $(0.05)^2$ = 400 respondents

Hence, the sample size according to the Slovin technique is 400 respondents. A total of at least 400 questionnaires would be self-administered to those within the sample population in the following table:

Table 1: Table showing the various clusters and sample

Subdivision	Sample
Giroux 1	35
Garoua 2	35
Garoua 3	33
Bibemi	33
Pitoa	33
Lagdo	33
Dembo	33
Gashiga	33
Barndake	33
Basheo	33
Ngong	33
Touroua	33
Total	400

Source: Author, 2021

We adopted a self-administered questionnaire as an instrument to collect our data. These Questionnaires contain several questions typed in a closed-ended form and open form administered to the farmers that are within the sample population. Additionally, for this study, Ordinal and nominal scales of measurement were used. The questionnaire contained mostly the Likert scale of five options ranging from strongly agree to strongly disagree. The first part of the questionnaire consists of personal information of the respondent or demographic information, the second part with three different sections consisting of government agricultural policy, and the last section is questions on poverty reduction.

Model Specification and Estimation Technique

The binary logistic regression analysis was adopted since the dependent variable is captured in terms of farm productivity that is whether they have been an increase in farm productivity or not as a result of government agricultural policies, which makes the dependent variable binary in nature. Binary logit model analysis is preferred over other techniques of data analysis especially the traditional Ordinary Least Square technique because the dependent variable is dichotomous or binary. That is (Yes=1) for an increase in farm production as a result of government agricultural policies and NO=0 for no increase in farm production resulting from government agricultural policies. Binary logit is also preferred over the Linear Probability Model analysis because of its limitations such as the nonnormality of the disturbance term, the heteroskedastic variance of the error term, and the non-fulfilment of the range of probability since it can give probability values of even less than zero or greater than one, low R^2, unrealistic linearity. Binary Logit is based on the cumulative distribution function of the logistic distribution.

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The logit model makes the probability of farm production a function of government agricultural policies (financial policies, climate change, extension/advisory services, and others). The model is specified in a generic form as:

$$\text{logit}(\pi(xi)) = \log(\frac{\pi(xi)}{1-\pi(xi)}) = \alpha + \beta_1 x_1 + \ldots \beta_j x_{ji} \quad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

The model can be explicitly specified as follows;

$$FP = \beta_0 + \beta_1 Age + \beta_2 Edu + \beta_3 Sex + \beta_4 MS + \beta_5 Exp + \beta_6 GEAS + \beta_7 GAFP + \beta_8 GACLP + \beta_9 GAIF + U \ldots(2)$$

Where;

- FP= Farm production measure in terms of Yes=1 for an increase in farm production as a result of government agricultural policies and NO=0 for no increase or otherwise.
- Age measured in terms of the number of years
- Edu= Level of education measure in terms of education attainment
- Sex= Gender of the respondent, which can either be a male or female.
- MS= Marital Status of the respondent, measured in terms of single or married
- Exp= Years of experience, measured in terms of years involved in main agricultural activity.
- GEAS= Government extension and advisory services, measured by computing the mean value for a set of questions on the availability and effectiveness of these services to farm productivity.
- GACLP= Government agricultural climatic policies, measured in terms of the mean value of various agricultural environmental policies implemented by the government to fight against the negative effect of climate change on agriculture.
- GAFP= Government agricultural financial policies, measured by the mean value of questions on the availability, effectiveness, and accessibility of government finances for agriculture by farmers.
- GAIF= Government agricultural infrastructures, measured by the mean value of questions on the availability of government infrastructure like farm-to-market roads, markets, and other processing units.
- β_1 to β_8 are coefficients of the variables, which are expected to be positive since the availability or increase in the variables has a greater tendency to increase farm productivity.

RESULTS AND DISCUSSIONS

This section focuses on the presentation of results and interpretations and rounds up with discussions of the findings.

Summary of Descriptive Statistics

Table 2: Summary of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GEN	399	1.6265	.4843231	1	2
Age	399	39.969	9.217587	19	64
EXP	399	12.548	5.722388	1	35
Marital_St~s	399	1.8847	.8062207	1	4
EDU	399	1.5964	.6762948	1	3
GEAS	399	12.564	2.280755	7.2	19.8

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GACLP	399	16.329	1.76877	8.333	20.8
GAFP	399	4.0375	.6770392	4.455	5.23
GAIF	399	5.4962	.5006136	6.652	8.32

Source: Author, (2022)

The table on summary of descriptive statistics shows the key statistical characteristics of the variables used in the model. The mean is the average of each variable, the standard deviation shows the deviation of values from the meanwhile the min and max value shows the lowest and highest value of each variable respectively. From the table, the mean value of gender is 1.6265 with a standard deviation of 0.4843 hence a smaller deviation from the mean. The age of farmers, which is measured in terms of years, has the highest mean value of 39.969 with a standard deviation of 9.217. The mean value of age shows that the youngest farmer was 19 years while the oldest farmer among the respondents was 64 years old. Also, the experience of farmers has a mean value of 12.548 with a standard deviation of 5.7223, meaning that the average years of experience of the farmers is 12.564 but the minimum value shows that the least experienced farmer has 1 year of experience in farming while the most experienced farmers have 35years of experience in farming. Meanwhile, marital status has four categories, the reason while the min and max values range from 1 to 4 while education has three categories (primary, secondary, and tertiary), the reason while the min and max value ranges from 1 to 3 respectively. The values of government agricultural policy (GEAS, GACLP, GAFP, GAIF) were obtained by the average or mean values of their indicators. From the table of summary of descriptive statistics, GEAS has the highest mean value concerning the other government agricultural policies with a standard deviation of 2.2807 hence a little deviation from the mean value. More to that, GAFP has the smallest mean values among government agricultural policies (4.0375) with a standard deviation of 0.6770. All the variables had a total number of 399 observations meaning that they had an equal number of observations hence no missing value.

Logistic Regression Results

Overall Model Results

Table 3: Overall Results

FP	Coef.	Std. Err.	z	P>z
GEN				
Male	-1.271095***	.3200265	-3.97	0.000
Age	.0198558	.0188826	1.05	0.293
EXP	-.0397623	.0299683	-1.33	0.185
Marital_Status				
Single	-.3528111	.49442	-0.71	0.475
Married	.1012261	.43733	0.23	0.817
Divorced	-.4328073	.5769269	-0.75	0.453
EDU				
Secondary/High Sechool	.1677151	.2506828	0.67	0.503
Tertiary	-.1937111	.3701459	-0.52	0.601
GEAS	.0941975**	.0499554	1.89	0.059

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GACLP	.0415822	.0643352	0.65	0.518
GAIF	.3790613*	.2252837	1.68	0.092
GAFP	.3366191**	.1719561	1.96	0.050
_cons	-1.083286	1.39637	-0.78	0.438
Obs	399			
LR chi2(12)	61.81			
Prob > chi2	0.0000			
Pseudo R2	0.112			
Log-likelihood	-245.10977			

Source: Author, (2022) Where; *=1%, **=5% and *=10% level of significant**

The results of the binary logistic model for the overall sample are presented in Table, which shows the effect of government agricultural policies and other demographic variables on farm production. From the table, the result of gender indicates that being a male reduces farm production as compared to their female counterpart. Meaning that female farmers increase farm production more than their male counterparts. Being a male reduces farm productivity by 1.27 and the results are significant at a 1% level of significant. The reason could be explained by the fact that more women are involved in farm production especially crop production than males in most of Northern Cameroon. Concerning agricultural policies, three policies show a significant effect on farm productivity.

Firstly, government extension and advisory services (GEAS) show a positive effect on farm production. This means that increasing extension services in the Benue division will go a long way to increase farm production. Specifically, increasing GEAS in the Benue division will lead to a 0.09419 increase in farm production and it is significant at a 5% level of significant. The role of extension workers and other advisory services is vital in increasing farm productivity in the Benue division. Secondly, another significant government agricultural policy on farm production is government agricultural infrastructure (GAIF), the results revealed that there is a positive relationship between GAIF and farm production. From the table, a unit increase in GAIF will lead to a 0.3790 increase in farm productivity in Benue division and it is significant at a 10% level of significant. Hence, government infrastructure such as farm-to-market roads, processing units or plants, agricultural training centers, and vocational centers, can increase agricultural production in the Benue division. Thirdly, the last significant government agricultural policy on farm production is the government agricultural financial policy. The result revealed that an increase or improvement of GAFP in the Benue division, will increase farm production by 0.3366 and it is significant at a 5% level of significant. Thus, government financial policies such as farm input subsidies, grants, and free interest loans can increase farm production in Benue division.

Above all, government agricultural climate policy has an insignificant effect on farm production in Benue, though the effect is positive. From the table, an improvement in government agricultural climate policy will lead to a 0.0415 insignificant increase in farm productivity in Benue. Other insignificant variables on farm productivity include; age, experience, marital status, and education.

The value of the chi2 statistics is 61.81 and it is significant. Meaning that the model is globally or jointly significant, hence the model is consistent and good for policy recommendations. Meanwhile, the value of PseudoR-square is 0.112, which is quite low, meaning that the model is well-fitted and the log-likelihood value is also low (-245.10977), meaning that the model is efficient.

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Farm Production and Government Agricultural Policies by Educational Experience of Farmer.
Table 4: Educational Experience Correlate

	Primary Edu. Correlate	**Secondary/High Edu. Correlate**	**Tertiary Edu. Correlate**
FP	Coef. (Z-Stat)	Coef.(Z-Stat)	Coef.(Z-Stat)
GEN			
Male	-1.690*** (-3.30)	-1.389*** (-2.58)	.1148 (0.12)
Age	.0302 (1.12)	.0102 (0.32)	.0240 (0.33)
EXP	-.0300 (-0.75)	-.0664 (-1.18)	-.0513 (-0.48)
Marital_Status			
Single	-1.319 (-1.46)	.6024 (0.70)	-.1070 (-0.08)
Married	-1.401 (-1.60)	1.105 (1.51)	2.259** (1.82)
Divorced	-2.228** (-2.19)	1.351 (1.27)	1.514 (0.86)
GEAS	-.1346* (-1.80)	-.0510 (-0.65)	-.1684 (-0.86)
GACLP	.1028 (0.99)	-.0312 (-0.31)	-.0434 (-0.20)
GAIF	.1303 (0.41)	.5956* (1.75)	1.301* (1.79)
GAFP	-.0076 (-0.03)	.6554** (2.29)	1.253** (1.85)
_cons	1.090 (0.49)	-2.132 (-0.97)	-5.628 (-1.19)

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Obs	204	152	43
LR chi2(10)	35.87	30.13	11.97
Prob > chi2	0.0001	0.0008	0.02869
Pseudo R2	0.127	0.1477	0.2009
Log likelihood	-123.2222	-86.9020	-23.8072

Source: Author, (2022), Where; *=1%, **=5% and *=10% level of significant**

To capture the variation in the effect of government agricultural policy on farm production across the different levels of education, we generated logistic results for the primary, secondary, and tertiary correlate as shown in Table 4. From the table, results of the primary correlate reveal that being a male in the primary education sub-sample reduces agricultural productivity as compared to their female counterpart in the sub-sample. This means that most males with a primary school education performed about 1.690 less farm production than the females with a similar level of education and the results are highly significant at a 1% level of significance. In terms of agricultural policy in this sub-sample, the results show that government extension and advisory services negatively affect farm productivity in Benue in the primary education sub-sample. Specifically, the effect is a 0.1346 fall in farm production in Benue. This could be explained by the fact that farmers with a primary school level of education do not make use of or even see the need for extension and advisory services. Most of them are more devoted to their custom farming methods. In terms of marital status in this sub-sample, being divorced with a primary level of education reduces farm productivity by 2.228 and it is significant at a 5% level of significance. Hence, if the number of divorces increases among farmers with a primary level of education, it will negatively affect farm production. Government agricultural policies with no significant effect in the primary correlate include government agricultural financial policy, government agricultural climate policy, and government infrastructure.

Secondly, in the secondary/high school correlate, being a male as an effect of gender also hurts farm production just as the case in the primary correlate. However, the effect in the secondary/high school correlate is smaller. Specifically, an increase in the number of males with a secondary and high school level of education reduces farm production by 1.389 as compared to a similar increase in the number of females in this sub-sample. The reason is that most men who achieve a certain level of education will prefer to engage in other activities or sectors than farm production, which is often seen as dirty. Concerning agricultural policies in the secondary/high school correlate or sub-sample, two government agricultural policies have a positive significant effect on farm production in this sub-sample, these policies are; government agricultural infrastructure and government agricultural financial policy. Specifically, an increase or an improvement in government agricultural financial policy will lead to a 0.6554 increase in farm production in this sub-sample and it is significant at a 5% level of significance. This effect was insignificant in the primary correlate, meaning that more educated farmers can easily make good use of government agricultural financial policies and increase farm productivity in the Benue division as compared to those in the primary sub-sample. Meanwhile, an improvement in government agricultural infrastructure will lead to a 0.5956 increase in farm production in this sub-sample and the results are significant at a 10% level of significance. Thus, government agricultural infrastructures significantly affect farm production in Benue in the secondary and high school correlate than in the primary correlate.

Thirdly, concerning the tertiary correlate which has the smallest sub-sample, the effect of gender is completely insignificant on farm production as compared to the primary and secondary correlates where the effect was significant and negative concerning the male gender. But in terms of government agricultural policies, two policies also exhibit a significant effect on farm production that is GAIF and GAFP just like the case in the secondary/high school correlation. Specifically, an improvement or increase in government

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agricultural infrastructure will lead to a 1.301 increase in farm productivity in Benue in the tertiary correlate and it is significant at a 10% level of significance. This effect is greater in the tertiary sub-sample as compared to the secondary /high school sub-sample. Also, an improvement in government financial policy will lead to a 1.253 increase in farm production in the Benue division and it is significant at a 5% level of significant. This effect is also greater as compared to primary and secondary/high school correlation. This means that farmers with a higher level of education can easily make good use of government agricultural financial policy as a means of increasing farm production in the Benue division.

DISCUSSION OF FINDINGS

The main objective was to determine how government agricultural policies affect farm production in Benue division. These policies include; government extension and advisory services, government agricultural financial policy, government infrastructural policy, and government agricultural financial services. These variables were selected from theories and empirical literature. The system theory identifies the government through its policies as an integral part of the agricultural system, the physiocratic theory traces the need for agriculture in an economy and is achieved through government policies, which outcome is improved agricultural productivity and poverty reduction.

From our overall findings, government extension and advisory services (GEAS) show a positive effect on farm production. Secondly, another significant government agricultural policy on farm productivity is government agricultural infrastructure (GAIF), the results revealed that there is a positive relationship between GAIF and farm productivity. Thirdly, the last significant government agricultural policy on farm production is the government agricultural financial policy. The result revealed that an increase or improvement of GAFP in Benue division will increase farm production. Meanwhile, government agricultural climate policy has an insignificant effect on farm production in Benue, though the effect is positive

Concerning government extension and advisory services, our results are similar to those of Elias et al., (2013) who evaluated the effect of agricultural extension program participation on farm production taking three case study kebeles (peasant associations) in Ethiopia. Primary data collected from 300 selected farm households, comprising extension participants and non-participants, were used in the study and analyzed using Ordinary Least Square (OLS), the result shows that extension participation increases farm productivity by about 6%. In conclusion, the extension program had a positive effect on farm productivity in the study area. On the other hand, Ngomi et al. (2019) using a similar estimation technique, empirically studied the determinants of adoption of agricultural extension services in the Centre region of Cameroon using a logistic regression model and results showed that years of education, farm size, income, distance to the nearest market and agricultural experience were the most significant determinants of adoption of agricultural extension service in Centre region of Cameroon.

Meanwhile, concerning financial services, our results are in conformity with those of Quiroga, et al., (2017), who combined a farm business panel dataset for 98 EU territories with a Stochastic Frontier Analysis (SFA) approaches, to assess the impact of four contemporary broad categories of common agricultural policies (CAP) subsidy programs on efficiency and environmental sustainability. The results suggest that first-pillar crop subsidies and pillar two environmental programs generate a disincentive effect on productivity, whilst in general, the CAP promotes technical efficiency convergence within Europe. But the findings are contrary to the findings of Kumbhakar, & Lien, G. (2010) who analyzed the impact of subsidy payments on farm production and efficiency. Their chapter examined how subsidy payments influence farm production and technical efficiency when subsidies are treated as endogenous variables in productivity and inefficiency models. Results show that subsidies as agricultural financial policy, negatively affected farm productivity but had a positive influence on technical efficiency.

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CONCLUSION

The findings confirm that government agricultural policies have a significant impact on farm production though government agricultural climate policies had an insignificant effect on farm production. Conclusively, government agricultural policies generally affect farm production in Benue division in the Northern region of Cameroon, thus the government can take advantage of these policies to improve the economic prosperity of farmers in the Benue division and reduce poverty and the problem of food security. In this light, there is a need for the government to train and deploy more extension workers in the various sub-divisions and communities in Benue division, to increase farmers' access to these services. This can be done by giving specific skills on how to produce dominant food crops and livestock in the Benue division through workshops and seminars. This is because most extension workers serve with general knowledge, which may not be useful in a particular context with specific agricultural products.

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