The Role of Agricultural Extension in Cocoa Production and Livelihood of Farmers in Meme Division, Cameroon

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Authors’ contributions

This work was carried out in collaboration among all authors. Author JD T designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors NSM and RNN collected the data of the study. Authors FAA and INM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Agriculture is important not only for its supply of food but also for its provision of raw materials. Cocoa is a lucrative cash crop grown in kumba, Meme Division of Cameroon. Given the importance of the crop to farm communities and the economy of Cameroon, agricultural extension has key roles to enhance production through information dissemination and adoption of innovations. This survey thus assess the role of agricultural extension in cocoa production and the livelihood of farmers in Meme Division. Through simple random sampling technique, 137 farmers were selected from the population of 210 registered cocoa farmers in the study area. A questionnaire made up of open and close ended questions was the instrument for primary data collection. The collected data was analyzed using SPSS and results revealed that 90% of the farmers were married men and 60% were of the age 35-49 years. Also, 74% of the respondents had been into cocoa farming for more
than 10 years, signifying that their livelihood depend on it. A low level of education is observed with 55% of them attaining only primary education. Moreover, 64% are small farm holders with 68% acknowledging use of family labor for production activities. Results further show that agricultural extension plays an essential role in cocoa production as 92% affirmed that extension provided information, knowledge and technical skills for capacity building and empowerment using Farmers Field School (FFS) and Farmers Business School (FBS) approaches. To 96%, extension initiates diffusion and adoption of innovations and organizes credits and market linkages (87%). Another 89%, were confirmative that extension liaise projects under the Program for the Improvement of Competitiveness of Family Agro-Pastoral Farms (with French acronym ACEFA) to accompany the farmers. Conclusively, extension service delivery empowers and ensures livelihood of farmers.

Keywords: Agricultural extension; innovations; production; livelihood; capacity building.

1. INTRODUCTION

Agriculture is important not only for its supply of food but also for its provision of raw materials. The potential of agriculture for reducing poverty and promoting food security varies according to the relative importance of agriculture in the livelihoods of the poor and the potential of the sector to grow in a way that increases returns to the assets held by them [1]. Cocoa is a highly lucrative cash crop and Cameroon ranks 5th in world’s production [2]. About 50% of the country’s cocoa beans comes from the South West Region [3] and according to estimates from South West Regional Delegation of Agriculture and Rural Development [4], of all the cocoa produced in the Region, about 40% comes from Meme Division, 14% from Kupe Muanenguba and 11% from Fako Division. It is almost impossible to talk about the livelihood of the people of Meme division without alluding to cocoa. Being the principal cash crop and source of income to the community, money gotten from the sales is used to feed, cloth, shelter and care for other basic needs of the farmers. Despite the importance of the crop, pests and diseases, poor conservative techniques, climate change, ageing of plantations and farmers, inadequate access to land, absence of an organized market, poor infrastructures and inadequate access to information and innovations threatens the quality and quantity of production. Agricultural extension has key roles to enhance production through information dissemination and adoption of innovations and thus receives high priority in the World Bank’s strategy for accelerating agricultural growth.

1.1 Objectives of the Study

The study specifically describes the social and farm characteristics of cocoa farmers, and determines the role of agricultural extension in cocoa production and livelihood of cocoa farmers in Kumba 1 Municipality of Meme division.

2. RESEARCH METHODS

2.1 Presentation of the Study Site

Kumba (Fig. 1) is a cosmopolitan town, which lies in the humid forest zone with mono-modal rainfall. The climate is typically equatorial with an average annual rainfall of 3000-4000 mm. The mean temperature is 24-35°C, characterized by hot days with high intensity of sunshine. Trees dominate the vegetation and the soil is loamy with high organic matter content suitable for the cultivation of cocoa, coffee, plantain, maize and vegetables [5].

2.2 Sample Size and Data Collection Technique

The study population consisted of 210 registered cocoa farmers in the Divisional Delegation of Agriculture. The study sample was determined using Yamane formula for sample size calculation when population size is known. The formula is expressed thus:

\[ n = \frac{N}{1 + N(e)^2} \]

Where,
- \( n \) = the sample size
- \( N \) = the size of population and
- \( e \) = the margin of error (0.05) when the confidence level is 95%.

The calculated sample size was 137 farmers and they were drawn from the population using simple random sampling technique. Principally, secondary and primary methods of data collection were used to put together the required data for the study. Secondary data were obtained
from books, journals, internet as well as project documents and annual reports from the Divisional Delegation of Agriculture and Rural Development Meme. The primary data for the survey was collected through questionnaire administration. The collected data was analyzed using the Statistical Package for Social Science (SPSS) and results presented as descriptive statistics on tables, pie and bar charts.

3. RESULTS AND DISCUSSION

3.1 Social Characteristics of Cocoa Farmers

Data analysis revealed that men (90%) dominate cocoa farming in Kumba (Fig. 2). This is no surprise because cocoa has been regarded as a “man’s crop”. Colonial masters promoted cash crop cultivation and oriented extension services towards cocoa, coffee and palms, which were raw materials for their industries. They operated through the cooperative system with the men providing the energetic and strenuous labour through all the production processes. With liberalization of the economy, the men opened individual farms and in line with the patriarchal system, the male children inherit the farms for continuity. This is in line with the assertions of Awoyemi and Aderinoye [7], that men dominate cocoa production. The role of the women is often confined to post harvest activities such as gathering of ripe pods, breaking of pods to remove beans, fermentation and drying.

Analysis presented in Fig. 3 shows that 60% of the respondents were of age 35-49 years while 25% were 50 years and above. Cocoa production activities are physically demanding and the youths are exploiting their energetic potential in the domain. This is an indication that the youths who are innovative and dynamic will easily adopt innovations in cocoa production and serve as channels of diffusion. Similarly, Osarenren et al. [8] considered 41–50 years as an economic active age that would result in positive effect on cocoa production. Moreover, many have inherited the cocoa farms of their parents and are riding on from where they ended. Contrary to perceptions that agriculture is for the old [9], the high rate of unemployment and school dropout instigated the youths in Kumba to take on farming as business/ insurance for livelihood.

Findings presented on Table 1 show that majority (72%) of the cocoa farmers were married and had household size of 1-10 members (88%). This implies that the spouses would be supportive during farm operations. The large family size further explains why 68% of farmers affirmed that the household provided much of the labour
needed in cocoa production. Large household could probably serve as an insurance against short falls in supply of farm labour [8]. Most of the respondents (74%) have been into cocoa farming for more than 10 years, signifying that their livelihood depend on this crop and are therefore willing to adopt innovations that enhance productivity of the crop. Moreover, continuous practice of an occupation can make a person more efficient and productive.

![Sex distribution of respondents in the study](image1)

**Fig. 2.** Sex distribution of respondents in the study

![Age of respondents in the study](image2)

**Fig. 3.** Age of respondents in the study

**Table 1. Social characteristics of respondents**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable modalities</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>99</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Widow(er)</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Household size</td>
<td>1-5</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>6-10</td>
<td>89</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>&gt;10</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Source of labour</td>
<td>Household</td>
<td>93</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Hired</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>Farming experience</td>
<td>&lt;5 years</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5-10 years</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>&gt;10 years</td>
<td>101</td>
<td>74</td>
</tr>
</tbody>
</table>
Concerning education, a low level of education was observed for the farmers as 20% had no formal education and 55% had attained only primary education (Fig. 4). As noted by Sofoluwe et al. [10], education may play an important role in adopting a new system of farming because as the farmers acquire more education, their ability to obtain and use information as well as resources improve. Considering the large family size, it is certain that upon completion of primary education, some family members become the sacrificial lamb for the more brilliant ones amongst them to pursue education. Low level of education adversely influence assimilation of extension messages, slow the rate of adoption of innovations and increase load of extension work due to repetition of information. Demonstrations are therefore necessary to enhance assimilation and utilization of information and skills diffused by agricultural extension.

Majority (82%) were landowners and 64% had farm size of 0-5 hectares (Figs. 5 and 6 respectively). This could be attributed to the fact that farm acquisition is by inheritance and as time goes by, the number of successions determines the size of the farm allocated to family members. This is very similar to the result obtained by Ogunlade et al. [11] in Nigeria that majority of cocoa farmers are either small or medium scale farmers.

3.2 Role of Agricultural Extension Services in Cocoa Production and Livelihood of the Farmers

Having access to extension services is a pre-requisite for determining its role in cocoa production because it is expected that only farmers who have access to agricultural extension services can ascertain their role in cocoa production and their livelihood. Based on this notion, 85% of farmers affirmed having access to extension services while 15% denied any access to agricultural extension services as shown on Fig. 7.

![Fig. 4. Educational level of respondents](image)

![Fig. 5. Land tenure system](image)

![Fig. 6. Farm size of the respondent](image)
Table 2. Role of extension in cocoa production

<table>
<thead>
<tr>
<th>Statement of role of extension in cocoa production</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of information, knowledge and technical skills for capacity building and empowerment</td>
<td>70%</td>
<td>22%</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Diffusion of innovations to increase production</td>
<td>84%</td>
<td>12%</td>
<td>1%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Organization of credits and market linkages</td>
<td>39%</td>
<td>48%</td>
<td>6%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Project packages</td>
<td>28%</td>
<td>61%</td>
<td>0%</td>
<td>7%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 2 is a Likert scale showing the role of agricultural extension services in cocoa production in Kumba.

**Provision of information, knowledge and technical skills for capacity building and empowerment:** Results show that 92% of the farmers were affirmative that extension provides information, knowledge and technical skills for capacity building and empowerment. Information and knowledge are initial tools in agriculture and having access to information on when and how to plant, prune, manage pests and diseases as well as fermentation and drying techniques are important parameters in cocoa production. The role of agricultural extension is to bridge the gap between farmers and research such that research findings are available to the farmers the end users and at same time take farmers problems to research centers so that innovations are tailored to the needs of the farmers. The quality and quantity of cocoa production depends on inputs like fertilizer, improved cocoa seedlings, which could be early in bearing, high yielding and resistant to pests and diseases. In Anderson and Feder [12], it is underscored that agricultural extension has long been seen as a key element for enabling farmers obtain information and technologies that can improve their livelihoods and its recognized as an important factor in promoting agricultural development. Information, knowledge, capacity building and empowerment is through extension approaches like Farmers Field School (FFS) and Farmers Business School (FBS). In FSS, farmers meet regularly during the cocoa production season on a farmer’s farm or on a collective farm as a classroom and with guidance of an extension agent as a facilitator, learn Good Agriculture Practices (GAP) to increase farm yields and farm income. Codjoe et al. [13] corroborates this by stating that when farmers accept information, practice and sustain them, it helps them to enhance production, income and reduce their poverty levels. Even though the focus of agricultural extension is encouraging adoption of innovations to increase production, income and ameliorate living standards of farmers, it is often observed that increase in farm income does not necessarily advocate improvement of living standards. Mismanagement of farm profits is underlined as one of the reasons why farmers remain poor and FBS is an extension strategy to help farmers become more accountable, keep records and take on farming as an enterprise in order to walk out of poverty and its related vices.
Diffusion of innovations and encouraging farmers to adopt innovations to increase production: This statement was confirmed by 96% of the respondents. Awareness of the existence of an innovation is an initial step in the adoption process. Jingdong et al. [14], stated that agriculture has fallen due to unawareness of modern agricultural technology. As emphasized by Idawati et al. [15], one of the efforts that could be made to pique the younger generations’ interest in the agricultural sector is by developing more advanced and modern agriculture based on innovation and technology which can produce products with high economic value which are demanded by the market. As noted in Bonye et al. [16], extension provides a source of information on new technologies for farming communities which when adopted can improve production, incomes and standards of living. This calls for the need to create awareness on the available agricultural innovations, which meet the farm needs of the farmers and make farming profitable. Extension services creates awareness through extension channels like Television and radio programs, printed material and general meetings. Some of such innovations as stated by the farmers in the cocoa sector are improved seedlings, mass sprayers, fermentation stations and solar dryers. The extension agents carry out demonstrations where necessary, to facilitate the adoption of these innovations in the cocoa sector.

Organization of credits and market linkages was affirmed by 87% of the respondents. Extension agents are seen as brokers facilitating farmers’ access to credits to purchase inputs for the farm business and as noted by Obuobisa [17], for small holder farmers to achieve higher productivity, timely access to short-term finance for input such as seeds, fertilizer, pesticides, herbicides, machines services, transport, labour and fuel is fundamental. License Buying Agents (LBAs) are often perceived as exploiters fatting themselves at the expense of the farmers. They determine weighing parameters and the price of cocoa beans because they provide inputs like pesticides and insecticides to the farmers. Poor marketing knowledge inhibits farmers to search for better markets and therefore get exploited too often by LBAs. To resolve the problem of input supply and exploitation by LBAs, agricultural extension encourages farmers to form cooperatives and producers organizations (PO) in order to purchase inputs at a lower cost as well as create market linkages for the cocoa beans.

Project packages: Results show that 89% of the respondents were positive that extension provides project packages. Programme for Improvement of Competitiveness of Family Agro-Pastoral Farms (with French acronym ACEFA) assists farm families through finance of agricultural projects (construction of ovens, warehouses), provision of agricultural inputs (improved cocoa varieties and fertilizer) and equipment (sprayers, trucks, barrows). Farmers benefit from sustainable projects initiated by themselves to achieve a better livelihood. Similarly, Yolar et al. [18] remarked that ACEFA programme among others have helped in the improvement of rural farmers’ livelihoods through increased agricultural productivity by giving agricultural input on time such as new varieties of seeds, fertilizers and agricultural training facilities. In a nutshell, these findings are in line with Amungwa et al. (2014) that agricultural extension assists farm people through educational procedures in improving farming methods and techniques, increasing production efficiency and income thereby bettering the living standards of the farmers.

4. CONCLUSION

Cocoa is an important economic crop in the study zone and its productivity greatly determines the wellbeing of the cocoa farm family. There is a link between agricultural extension and agricultural productivity. Efficient extension service delivery strengthens farmers, communities and ensures livelihood as it makes cocoa production more profitable due to increase in production, and farmers’ farm income.

5. RECOMMENDATION

Collaboration amongst stakeholders is necessary for effective dissemination and implementation of information, adoption of innovations and execution of agricultural projects in order to ensure sustainable livelihood.

CONSENT

As per international standard informed and written participant consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.
REFERENCES


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