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UNDERSTANDING THE PRODUCTION AND SALES DETERMINANTS OF HARICOT BEANS (PHASEOLUS VULGARIS L.) IN THE WESTERN HIGHLANDS OF CAMEROON

[1,*]Siri B. Ngoh, [2]Joyce, B. Endeley, [3]Ambe T. Emmanuel and [4]Molua E. Lytia

[1]Institute of Agricultural Research for Development (IRAD) Ekona center, PMB 25 Buea, Cameroon
[2]University of Buea, Cameroon, PO Box 63, Buea, Cameroon
[3]BAM4Africa Capital, Johannesburg, South Africa
[4]University of Buea, Cameroon, PO Box 63, Buea, Cameroon

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ABSTRACT

Haricot beans (Phaseolus vulgaris l.) is among the food crop grown in Cameroon for food security due to its high nutritional value and income earning abilities. Moreover, it is also a tradable as its value chain extend from Cameroon to neighboring countries thus an important foreign exchange earner. However, most rural farmers have not exploited its full potential due to some supply side constraints such as production and agronomic shortcomings as well as demand side constraints such as suboptimal markets and sales conditions. This research therefore focuses on some of the factors influencing farmer's production and sales of haricot beans in the Western Highlands of Cameroon. Two hundred farmers from 24 villages participated in the study. The key findings indicated that most of the farmers were advanced in age and married with low educational attainment. Intercropping system, rainfed farming, lack of access to information negatively influence the production of this crop. So too was the long value chain, the adverse on-farm sales period, negatively influenced farmers income. It is therefore recommended that development interventions should emphasis on access to timely information using tools such as "talking" smart phone applications and social media to enhance production and the accrued monetary benefits.

Corresponding author

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INTRODUCTION

Haricot beans (*Phaseolus vulgaris L.*) is a major crop grown and marketed in the Western Highlands of Cameroon. It is grown for its high nutritional value and potential as a source of income for the farmer. This makes haricot beans an ideal crop for simultaneously achieving three developmental goals: reducing poverty, hunger and improving human health (Akibode *et al*. 2011). Furthermore, the demand for the crop has been increasing substantially over time driven by both local demand and export to neighboring countries such as; Central African Republic, Equatorial Guinea, Gabon, Chad, Nigeria and the Republic of Congo (Siri *et al*. 2014). Besides the cross-border demand, the crop is highly solicited by institutions that feed their members such as boarding schools, hospitals, prisons, orphanages and military camps (*ibid*, 2014). This has therefore created opportunities for haricot beans farmers to take advantage of the increasing demand by effectively and efficiently harnessing the production and market systems and actively participating in the supply chain within and across national borders. If this is effectively done, these farmers will reap substantial and multiplier effects that will tantamount to better human development outcome not just to the famers and their families but to their community in general.

It is important to note that the quantity of haricot beans produced and sold varies according to the farming system, technology used, and the wealth of the farming household. Nevertheless, Chalwe (2011) observed that the rising demand for haricot beans in terms of volumes sold in specific markets is not commensurate to the participation of farmers in the sector. Farmers participation in the production and marketing of the crop is low as compared to the available business potentials in this sub-sector. There are several reasons advocated for this paradox. Muimui (2010) posited that farmers encounter multiple constraints ranging from inadequate production resources, hence leading to low production levels and inadequate participation in the market. Kayama (2010) place the blame on the lack of interest from local authorities, donors, and Non-Governmental Organizations and local authorities in showing interest in the promotion of this crop, let alone understand the constraints faced by farmers. On the other hand, it has been postulated that low productivity in the sub-sector is due to inadequate production resources such as poor access to land, labor force, inputs (seeds, fertilizers pesticides etc.), capital, technology and extension services as well as transport access (Alemu and Meijerink 2010). The lack of these resources affects overall production in terms of quantity and quality produced, volume of products traded as well as market consistency (Randela *et al.* 2008).

According to Barrett (2008), market participation is directly associated with the generation of a market surplus; thus, production technologies and productive assets affect farmers' market participation, thereby influencing the benefits that accrue to farmers. Therefore, for farmers to be able to participate and benefit from access to market, there must be a crop surplus, or they have to harvest an amount above their own consumption needs. Leavy and Poulton (2007) further stated that market participation plays a significant role in increasing incomes and stimulating rural growth, through improving employment opportunities; increasing agricultural rural productivity; direct income benefit for farmers, as well as expanding food supply and potentially improving nutritional status. In most cases, these increased incomes have led to increased food consumption and improved nutrition. According to Muimui, 2010; Kayama, 2010 and Bigsten, 2008, majority of farmers are faced with a range of marketing challenges such as poor access to market and market information, high transaction cost to input and output markets, infrastructure limitations, limited access to market opportunities and exploitative pricing by middlemen. These factors restrict the ability of haricot beans farmers to expand the scale of production and invest in technologies that increase efficiency and add value to primary production. It further limits the incentives of these farmers to participate in formal market, hence making it difficult to shift into commercial farming. As a result, their contribution and participation in domestic and international markets remain low.

Therefore, given the plethora of problems faced by farmers in Cameroon in general and those cultivating haricot beans in particular, there have been very little or no research to understand the principal actors, participation rate, markets and production constraints faced by farmers in the production and sales of haricot beans in the Western Highlands. Although International Organizations such as Pan African Bean Research Alliance (PABRA) and the Institute of Agricultural Research for Development (IRAD) based in Cameroon have carried out activities on haricot beans in Cameroon, most of the activities are focused on agronomic aspects such as disease tolerance, soil management and multiplication and adoption of improved seeds (Ngueguim *et al*. 2011; Mboussi *et al*. 2012 and Siri *et al.* 2016). Hence, information on the determinant of farmers' participation and benefits in haricot beans production and sales in the study area remain scanty. Likewise, there appear to be no research on the participation of women and men in the production and marketing of haricot beans in the Western Highlands. It is no secret that women and men are affected differently by constraints of agricultural production and marketing. Consequently, a comparative approach to study the problem of haricot beans production and marketing in the Western Highlands will generate a more holistic understanding of its problems and solutions. Therefore, the potential of haricot beans to contribute to growth in the rural areas and livelihoods of farmers is not likely to be achieved if the constraints are not identified and addressed. It is for this reason this research is undertaken with the broad objective to examine the production and sales determinants of haricot beans in the western highlands of Cameroon.

MATERIALS AND METHODS

Description of the Study Area

The study was conducted in the Western Highlands of Cameroon and covered five Sub-divisions, namely; Foumbot and Kouoptamo in the West Region and Babessi, Kumbo and Ndu in the North West Region. The choice of these areas was based on fact that they are the main haricot beans production and marketing areas in the region (Ngueguim *et al*. 2011). The Western Highlands is one of the agro-ecological zone situated in the South-Western part of Cameroon and covers the North West and West Regions. It is further subdivided into three ecological zones based on altitude; lowland (<800m a.s.l), mid altitude (800 – 1500m a.s.l) and highlands (> 1500m a.s.l). Its topography varies greatly from depressions lower than 400 metres to the mountain tops some 3000 metres above sea level. The population of the agro-ecological zone stands at about 3.6 million with an average of 90-300 inhabitants per km^2 (2005 Census). Over 70% of the population depends entirely on agriculture for livelihood (GP-DERUDEP, 2006). The notable crops grown include maize, Irish potatoes, cassava, carrot, cabbage, onion, leaks, green pepper, green beans, yams, water melons and haricot beans.

Sampling Procedure and Sample Size

A multi-stage sampling procedure was used to select sampling units. In the first stage, a purposive sampling technique was used to select the zone, regions, divisions and Sub-divisions. These were selected based on observations and information in the literature which portrays them as main haricot beans producing and marketing areas (Ngueguim *et al*. 2011 and Siri *et al.* 2014). In the second phase a purposive sampling technique was again used to select twenty-four villages (five villages per Sub-division and all the four villages in Babessi Sub-division) which constituted the accessible population of the study. This was established with the help of the Sub-Divisional Delegates of Agriculture in the Sub-divisions and the Village Head in the various villages. Snowball technique was used in the third stage to select a sample of 200 farmers in twenty-four villages. The study mainly focused on farmers who cultivate and market haricot beans to capture their

production and marketing experiences. Eight (08) farmers were selected from five villages each in Kumbo, Ndu, Foumbot and Kouoptamo Sub-Divisions. This was not the case in Babessi Sub-division since it is comprised only of four villages. Ten (10) farmers were selected in all the four villages in this Sub-division. Thus, a sample size of forty (40) farmers was selected in each Sub-division, making a total of two hundred (200) farmers in the entire study. Farmers had to meet the following eligibility criteria to be considered for the study: 1) the farmers must cultivate and market haricot beans, 2) Cultivated at least 0.5 hectare, 3) Sell at least 300kg of haricot beans during the main growing season and 4) live permanently in the community.

Data Collection Procedure

The study made use of a structured questionnaire and an interview guide to gather primary data. The researcher used a self-designed questionnaire for data collection which comprised both closed-ended and open-ended questions. Sample information were collected on variables such as socio-demographic characteristics of farmers including sex, age, marital status, education, household size, source of income, and years of experience. Information on the farming systems and the different production seasons practiced were also obtained. Finally, the constraints and challenges involved in marketing the crops were collected from the farmers. Three focus group discussions were held to clarify issues that generated divergences and controversies in the course of data collection and post-data analysis. This was conducted using an interview guide with farmers in Babessi, Kumbo and Foumbot Sub-division in order to reflect the activities of the two production seasons in the two regions.

Data Analyzing

Data were analyzed using descriptive statistics, Chi-square test, Mann Whitney U Test and Kruskal Wallis Test. Descriptive statistics such as frequency distribution, percentages, mean and mode as well as Chi-square test were used in analysis the socio-demographic characteristics of farmers and the constraints faced by farmers. Meanwhile, quantitative data were analyzed using Mann Whitney and Kruskal Wallis tests.

RESULTS AND DISCUSSION

Socio-demographic characteristics of farmers

Table 1 displays the frequency distribution of haricot beans farmers according to their socio-demographic characteristics. The findings revealed an aging population in which 56.5% of the participants in the study were older than 41 years with a median age of 40 years dominated in the cultivation and sales of haricot beans. This is due to high incidence of rural exodus of the youthful population to urban areas in search of greener pastures. Similar results were reported by Abera, (2009); Chalwe, (2011) and Ayalew, (2011) which reveal that majority of the farmers are above 41 years. Although experience is gained with age, farming needs not to be dominated by an aging population as this is likely to have negative implications on future haricot beans production in terms of labour availability and adoption of new technologies. Farmers captured in the study revealed that the majority (75%) had low formal educational background with majority of women having no formal education. This suggests that haricot beans farmers have relatively low educational level, a trend that could negatively impact on farmer's adoption of innovations since literacy level influence the rate at which farmers adopt technology (Nyagaka *et al.* 2009). This is also in line with the World Bank findings that majority of farmers and traders are illiterate with poor technological skills which can be a serious obstacle in accessing useful institutions on technical knowledge (World Bank Report, 2008). This therefore implies that written market information is of minimal benefit to most

Table 1. Socio-demographic Characteristics of farmers

Variable	Frequency	Percentage
Sex distribution of farmers		
Women	100	50.0
Men	100	50.0
Age distribution of farmers		
20 - 25	6	3.0
26 - 30	30	15.0
31- 35	22	11.0
36 - 40	29	14.5
41 - 45	29	14.5
46 - 50	35	17.5
51 and above	49	24.5
Marital Status of farmers		
Married	164	82.0
Single	28	14.0
Widow	6	3.0
Widower	2	1.0
Educational level of farmers		
No formal education	57	28.5
Primary school	93	46.5
Secondary school	36	18.0
High school	13	6.5
University	1	0.5
Household Size of farmers		
1-3 persons	11	5.5
4-6 persons	60	30.0
7 persons and above	129	64.5
Number of years of experience		
2-5 years	16	8.0
6-10 years	31	15.5
11-15 years	29	14.5
16-20 years	51	25.5
21-25 years	20	10.0
26-30 years	24	12.0
Greater than 30 years	29	14.5

Source: fieldwork, 2015

Table 2: Distribution of haricot Beans Farmers by Farming System and Sex

Sex	Farming System			Total
	Mono-cropping	Mixed cropping	Both	
Men	64	24	12	100
	64.0%	24.0%	12.0%	100%
Women	48	33	19	100
	48.0%	33.0%	19.0%	100%
Total	112	57	31	100
	56.0%	28.5%	15.5%	100%

Source: Field work, 2015

Table 3: Distribution of haricot Beans Farmers by Farming System and Regions

Region	Farming System			Total
	Mono-cropping	Mixed cropping	Both	
North West	32	57	31	120
	26.7%	47.5%	25.8%	100%
West	80	0	0	80
	100.0%	0.0%	0.0%	100%
Total	112	57	31	200
	56.0%	28.5%	15.5%	100%

Source: field survey, 2015

haricot beans farmers to understand and interpret market information. This educational gap is more of a constraint for women in processing market information. The study revealed larger household sizes, with a greater proportion of farmers (64.5%) having at least 7 members per household. Large household size in a family also means the household may not need to hire additional labor and the savings could be used for purchasing other production inputs. This will increase the household's possibility to produce marketable surplus. This finding is in line with the works of Martey *et al.* (2012) in Ghana who found that farming communities had large family size for agricultural purposes and that this labor force motivates them to participate in cassava marketing. On the other hand, Asfaw *et al.* (2010) reveal that large household sizes negatively affect production output. They posited that farmers with large household sizes consume much of the output and hence participate less in the market. However, field experience revealed that the size of the household did not influence the quantities marketed as farmers with household sizes of between 1-3 persons averagely marketed the same quantities (1003kg) as those with more than 7 persons. Therefore, haricot beans production across the study area is primarily for the market. Another implication of larger household sizes is likely that women's responsibilities will be much heavier to meet up with food needs and welfare of the family since women are more inclined to these responsibilities. Hence, their propensity of participating in the marketing of haricot beans will decline.

Factors influencing the quantity of haricot beans produced

The factors considered in this study that are known to influence the quantity of haricot beans produced for the market include the farming system practiced and the production season (Randela *et al.* 2008). In terms of farming system practiced, the findings indicated that the farmers practiced mono, mixed and sometimes both cropping system depending on the different production season. Over half (56.0%) of farmers practiced mono-cropping system, this was followed by those who practiced mixed cropping (28.5%) and a minority who practiced both systems (15.5%). However, there was a significant association between the cropping system practiced and sex in the studied areas ($\chi 2$=104.762; df=1; P=0.001) as shown on table 2. Men were more involved in mono-cropping while women practiced both systems. This discrepancy may be due to the fact that the men produced solely for the market while women practiced both systems for the market and for home consumption. Further analysis revealed that farmers in the West Region practiced essentially mono-cropping (100.0%) as shown on Table 3. Jenkins, (2011) reveals that mono-cropping of red haricot beans is more profitable for the households compared to planting it in association with other crops or intercropping. This affirms the study findings where farmers in the West Region produced and marketed larger quantities as a result of mono-cropping practiced during the second season that runs from August to November. Farmers in this region reported that with increasing pressures on agricultural land resulting from population growth, they had to explore new ways to intensify production per unit area of land. Farmers in the North West Region intercropped haricot beans with various crops like maize, potatoes, huckleberry, groundnut and cocoyam in order to diversify production per unit area of land especially during the first season. However, it was observed that haricot beans are commonly intercropped with maize due to their strong agronomic compatibility as evidenced in the North West Region (Ngueguim *et al.* 2011). During focus group discussion, the farmers mentioned that intercropping is preferred for two main reasons: minimize cost of production and security against crop failure as a result of pest and diseases or bad weather. Furthermore, it was revealed that intercropping was also meant to satisfy the farmer's family taste for varieties of crops. Intercropping is therefore an important aspect of livelihood diversification with the potential of diversifying the food basket of small-scale agricultural producers. Fenandez-Aparicio *et al.* (2007) argue that intercropping is advantageous for soil conservation, weed control, lodging resistance and yield increment and legume root parasite infection control. The practice of both systems was however only done by farmers in Babessi and Kumbo Sub-divisions and this was carried out during the March (mixed cropping) and September (mono-cropping) cultivation seasons. Overall, mono-cropping system was predominately practiced. Consequently, these farmers are expected to have higher yields because all the production resources are directed towards a single crop. Although the second cropping season has been established to be the best for haricot beans production in the West Region due to climatic compatibility, this is not possible in some parts of the North West Region like Kumbo and Ndu. This rather contradictory result may be due to the rapid decline in soil moisture immediately after rains have ceased leading to water stress, thus affecting production. Another possible explanation for this is that the maize season is usually very long (about 5 months in most parts of Kumbo) which does not allow for the cultivation of second season crops due to water stress. Another important limitation gathered during focus group discussion was that, animals are allowed to stray and feed on farm residues after first season harvest, thus discouraging second season cultivation for haricot beans production. This was highly noticed in Ndu Sub-division where second season cultivation was almost absent.

Factors influencing farmers' market participation

The variables considered in this study include: the position of farmers in the market chain, the sale periods and the market channels, site of sales as well as determinant of market prices. It is assumed that these variables have an influence on the quantity of haricot beans sold, level of market participation and the derived benefits.

Position in the value chain

Employing statistical tool of Chi-square test, a significant difference was found amongst farmers status in the market ($\chi 2$=8.672; df=1; P=0.003). A greater proportion (82%) were wholesalers while a minority (18%) were bulk sellers. This, therefore, implies that majority of the farmers end as wholesalers while very few continue as bulk sellers. A possible explanation of this finding may be lack of adequate storage facilities and other market infrastructures like warehouses to store the produce for future sales. Another important explanation is the need for immediate cash since haricot beans is considered the main source of income in the sample area. As a result, they are obliged to sell immediately to bulk sellers and with little benefit made. However, this finding refutes the ideas of Ferris (2008), who found that women were the main traders in haricot beans markets in Ethiopia. Amongst the remaining 18% who are bulk sellers, men (26%) are more involved than women (10%). These are farmers who owned warehouses either in their houses or in the

market to either sell to distant traders, exporters or institutions. This buttress the fact that women are not only involved at the subsistence level in haricot beans activities but are also actively involved in income generation. Field findings further revealed that bulk sellers make higher profits than wholesalers because the longer the sales period the higher the price for haricot beans. It is interesting to note that men who operated at the bulk seller level, make higher profit than women. It seems possible that this discrepancy is due to the difference in ownership of production resources, market infrastructure and financial strength to move higher. By region, the data reveals that bulk selling was significantly more practiced in the North West (22.5%) than West Region (11.3) ($\chi2$=4.116; df=1; P=0.042). Proximity to towns and urban markets, distance and state of road could have an influence in farmers' position in the market chain.

Sale period

In connection to the different sales period, the findings revealed that farmers sold differently after harvesting haricot beans and the longer the sales period the higher the derived benefit. This implies that farmers will face lower prices as the supply to the market increases. It was observed that haricot bean is sold year-round, with peak sales occurring immediately after harvest (June - July), for the first season production and November - December for the second season production, and towards planting seasons (September and February). As far as sales are concerned, significant differences were observed between farmers and the period during which haricot beans was sold ($\chi2$=21.970; df=6; P=0.001). A greater proportion of farmers (45.5%) sold immediately after harvest; about a quarter (24.0%) sold 2 months and 5-6 months after harvest. Thereafter, about 7% of farmers could sell 6 months after harvest. The reasons for immediate sales of haricot beans after harvest are due to lack of storage facilities and need for cash. Bachmann and Earles (2000) contend that farmers with proper storage facilities do not need to market their produce immediately after harvest when prices are low. According to findings from the field, majority of the farmers sold immediately after harvest in order to avoid post-harvest losses (including theft incidence) and due to limited access to storage facilities. In addition to the above explanation, the period immediately after harvest is a very critical stress period, in terms of both cash and food needs by farmers. Therefore, sales are triggered by the need for cash to repay debts incurred during production (seed, fertilizers and labour debts), pay schools fees and buy other food items.

Analysis of period of sales by sex reveal that more women (69%) were in the habit of selling their crops immediately after harvest than men (32%). The fact that women are mainly responsible for meeting the basic needs in their household, obliged them to sell immediately after harvest to earn household income. Amongst these women, 63.3% said they did so due to high demand from bulk sellers and they sell because they needed to pay for unsettled debts incurred during the production season (labor, fertilizer and other inputs) and to take care of family needs. Another 29.5% said they sold immediately because they lacked warehouses in which to store harvested products. Besides, they are unable to avoid pest and rodent attacks (weevils and rats) and thieves. Meanwhile, some of the farmers (7.2%) expressed the belief that when haricot beans seeds are stored, it reduces the quantity and quality, hence a drop in its market value. On the other hand, and unlike women, some men do not sell during the early part of the harvest season because haricot beans prices are very low. The price ranges from 8 USD to 9 USD for 17kg (Focus group discussion). Amongst the 24% who sold two months after, 31% were men while 19% were women. They use earned money to pay for children's school needs. Another 24% sold six months after and of this percentage, 27% were men while only 7% were women. This difference could be explained by lack of access to proper storage facilities by women and also the fact that men wanted to maximize profit by selling when prices got higher. Overall, this set of farmers regards this practice as the best way to maximize profit in haricot beans marketing. Further analysis revealed that farmers in the North West Region extended their sales period up to six months after harvest while those from the West Region exhausted their crops for sales within the first three months after harvest. This might be due to the distances to urban and big markets, which are further away from the North West Region compared to the West. It was observed that the sales period greatly determines the market price as well as the benefit derived from sales. A farmer in Kouoptamo recounted that three different prices existed for the white haricot beans variety: the price of haricot beans sold immediately, 3 months and 6 months after harvesting period; the respective prices are 15 USD, 24 USD and 30 USD for 17kg. Thus, selling long after harvest when the demand is high and supply is low results in higher prices and profit margin.

Market chain

Analysis of the market chain indicates the following actors: collectors, wholesalers, bulk sellers, distant traders and exporters in the study area. It was observed that the farmer's choice of buyer depends on the quantity of haricot beans available, sale period and social relationship with the different actors. It was found that 61% of buyers were bulk sellers as compared to 17% who were distant traders. Furthermore, 76% of farmers said bulk sellers were the most preferred buyers because they buy at any time, at home, in very large quantities and pay immediately. On the other hand, 89% of farmers expressed dissatisfaction due to the low buying prices (8 USD for a 17kg of meringue (local name for one of the sub variety of haricot beans)). Bulk sellers also used exploitative measuring units (for instance 22kg instead of 17kg measuring buckets). Farmers further complained that they determine the buying price. Statistical analysis revealed a significant difference by sex and buyers of haricot beans ($\chi2$=32.507; df=3; P=0.001). A greater percentage of women haricot beans farmers (73%) sold to bulk sellers compared to men (49%). On the other hand, about a third of men (31%) sold to distant traders against just (3.0%) of women farmers. Although bulk sellers were the main buyers across the study area, women, more than the men, preferred this channel. This discrepancy may be due to the fact that bulk sellers buy at any time irrespective of the quantities and do so at home, with no transportation cost involved. They equally pay immediately. Therefore, this set of buyers served as "financial insurer" for women each time they found themselves in crisis. However, a majority of the women complained that bulk sellers buy at low prices using exploitative measurement as mentioned above. A positive relationship was found between the market channel and the quantity of haricot beans sold. Findings equally revealed that though farmers in both regions sold more to bulk sellers and distant traders, significant differences existed between buyers ($\chi2$=41.999; df=3; P=0.001).

Farmers from the North-West Region sold more to bulk sellers (64.2%) while those in the West Region did so to distant traders (33.8%). Further analysis revealed that bulk sellers sold the most to distant traders (75.0%) while wholesalers did so mostly to bulk sellers (73.2%). Bulk sellers were more likely to sell larger quantities to distant traders, exporters and institutions as opposed to wholesalers. This could be because bulk sellers are more likely to afford larger quantities compared to wholesalers. In addition to larger quantities, bulk sellers are more likely to have post-harvest facilities and transportation means to reach out to distant traders. Implying that market variables including amount of haricot beans stored, the volume, transport logistics and price are very important in determining farmers market participation. This influence both the decision to sell and the choice of the marketing channel. The findings are consistent with those of Jayne *et al.* (2003) who acknowledged that farmers without transport means sell more to middlemen and at their houses.

Besides the above-mentioned buyers, farmers also sell to exporters and both public and private institutions (boarding schools, hospitals, prison yards, military camps, and orphanages) through market contract. However, only 43.5% of farmers said they were exposed to these sets of buyers and had market contracts. Besides, a majority (88.9%) of farmer with such opportunities were bulk sellers. Of this percentage 90% were men and just 10% were women. There was a significant variation in the average quantities sold by those with and without market contract (Mann Whitney U Test (U=3050.000; P=0.001). Farmers who have contract with boarding schools and distant traders or exporters averagely sold more quantities (1190kg) compared to quantities (714kg) sold by those with no contracts. Exporters were in the majority of those who bought haricot beans six months after harvest. Therefore, the market chain greatly influenced the derived benefits and the nature of farmers' participation.

Site of sales

Farmers across the study areas sold at warehouses, main markets, at home or around the villages depending on the sex, quantity sold, state of the road and the market status of farmers. The mode of sales site was the home (36.5%) followed by main market (29.5%). The author adds that this has an influence on the transaction costs, and in the decision-making capacity concerning alternative market opportunity, such as selling at the farm gate, around the village, at home or the main market. The site of sales differed significantly by sex ($\chi2$=38.122; df=5; P=0.001). While men farmers said they sell their crops in warehouses (49%), main market (34%) and a few at home (9%), women farmers do same at home (44%), main market (33%), around the villages (24%) and none at warehouse. Based on the information on focus group discussion with farmers in Kumbo, the location of sale points is associated with the traditional responsibilities of the farmer, quantities sold, transaction cost which is influenced by the distance to the market and the state of the road. For example, it is likely that women sell the most at home perhaps because of their triple responsibilities, which leave them with little or no time to participate in marketing activities beyond the home. In addition to triple responsibilities, socio-cultural norms also limit women's mobility and choice of sale points (World Bank, 2008). There was equally a significant variation in the selling point by region. Farmers in the North West Region sold more in main market (45.8%) followed by warehouses (28.3%), and home (15.8%), while those in the West Region sold at home (48.8%) and main market (41.3%). This is logical since farmers sell more to bulk sellers and distant traders. Likewise, Chi-square statistics reveal a significant variation in site of sales by market status of farmers ($\chi2$=51.586; df=5; P=0.001). Bulk sellers regularly sold at warehouses (38.9%), while wholesalers sold at home (43.2%). The difference in sale points reflects the quantities of haricot beans sold. Bulk sellers sold larger quantities compared to wholesalers. More than half of the farmers (71%) said that selling around the villages and at home gave them better profit than selling in the market because the latter entails additional transaction cost.

Determinant of market prices

The selling prices of farmers were either determined by the sellers, market authority or imposed by buyers or ensued bargain with buyers (collectors, wholesalers, bulk sellers, distant traders and exporters). Chi-square test reveal important variation in price determinant by sex ($\chi2$=60.043; df=5; P=0.001) and region ($\chi2$=53.928; df=5; P=0.001). The study revealed that the selling prices for men were mostly determined through bargaining (52%) or dictated solely by bulk sellers (27%). On the other hand, women selling price were determined mainly by bulk sellers as reported by 77% of women farmers while 12% said it was done in bargaining. This is likely because most women do not keep record on costing and hence have no basic for bargaining when selling their produce. This stems from the high illiteracy rate of women as gathered from the sample area.

As faw *et al.* (2010) in their study in Tanzania and Ethiopia on smallholders, found out that education reduces transaction costs and market entry barriers as it enables farmers to obtain and process market information and gives farmers a better negotiation skill. In the same light, Bienabe *et al.* (2004) contended that access to storage facilities increase farmers' flexibility in selling their produce as well as their bargaining power. However, lack of storage facilities accounted for only part in limiting their bargaining power in this study because most of the women do not store haricot beans. As such, there are higher quantities available in the market, leading to price dictation by the middlemen. By Region, the selling prices in the North West Region were determined by bulk sellers as reported by 45%, while 35% of farmers established their prices through bargaining. Meanwhile, 40% of bulk sellers were the main determinants of prices in the West Region while other farmers negotiated prices with the buyers. In establishing the market prices for haricot beans, the research sought to find out if farmers had prior knowledge of the selling price in the market. Worthy to note that about a quarter had no clue, while about 35% agreed. By sex, majority of the (51%) men said they were aware of the selling price compared only to 19.4% of women.

Conclusion

The objective of this study was to examine the key determinants that affects the participation of farmers in the production and sales of haricot beans in the Western Highlands of Cameroon. Specifically, the study described the demographic characteristics of farmers and their influence on production and sales of haricot beans. It also assessed the factors that determined the quantity of haricot beans produced and marketed by farmers.

Finally, the study examined the factors that affect farmers' sales of haricot beans. The study established that Haricot beans is an important crop to farmers in the study area because it greatly enhances the farmer income and improve nutrition because of its high calorific and nutritional value. Therefore, this crop has a great developmental value and its production and sales plays a vital role in reducing rural and urban poverty since its market value chain extend from the rural to the urban centers to neighboring countries thus also serving as a source of valuable foreign exchange earner. The study also revealed that married women and men above 41 years with low educational background dominate the production and sales of haricot beans. In most situations, the haricot beans farmers depends on this crop for their livelihood.

As expressed by the farmers, the quantity produced and marketed was influenced by the farming system practiced and the production season. More men practiced the mono-cropping system and this was essentially in the West Region, while women practiced both mixed and mono-cropping. It was established that participation in haricot beans sales depends on many factors amongst which are: the farmers' position in the value chain, the sale period, the market channel and site of sale. Overall, it was established that women derived the least benefits from the production and sale of this crop due to poor management of the key determinants that influence the production and sale of this "cash" crop.

Recommendation

The study revealed weak bargaining power especially for women farmers. Therefore, farmers should also be encouraged by extension workers, NGOs, traditional and local councils to form effective producer groups and networks. This will help improve their bargaining power when purchasing inputs and marketing their produce. The producer's groups should be encouraged to sell their products directly to the end consumers, thereby, reducing the length of the supply chain and thus the farmers would save on the profit margins that would have otherwise accrued to the middlemen in the value chain. Improving access to micro or otherwise credit and insurance facility is also an important step in improving the bargaining power of the farmers in the sense that the farmers would not be in a rush to sell their product at the farm gate to payoff debtors.

Extending the sales period also reduce the wide swing in price variability and thus making the price to be more determinative to all the actors in the value chain. Moreover, mono-cropping with its associated better quantitative and qualitative yield was most often shunted for mixed or intercropping because it acts as some of protection against crop failure. In this regard, if the farmers could have access to crop insurance products, it will encourage them to practice mono-cropping with its associated substantial added benefits. The study also revealed limited access to timely information about market signals such as current sale price of haricot bean. It is therefore recommended that community communication schemes such as community radio and extension services should regularly communicate the prices of the product in the market. Moreover, internet based application that has a "talk" facility as opposed to a reading interphase should be developed to provide the farmers with real time base information about the sales of haricot beans. This is possible because access to cheap mobile smart phone is now ubiquitous in the study area,

Access to storage facilities remain a key challenge to haricot beans production and marketing in the Western Highlands. Therefore, the state and local council should commit themselves to develop and improve infrastructure, especially grain stores in haricot beans production areas. Better access to storage facilities will enable farmers to extend sales periods and present more haricot beans of better quality for sale. The extension service should be encouraged to do everything to improve upon the infrastructure available in the haricot beans cultivation area as well as adopt a commercial mentality in the cultivation and sales of this crop. This will help in reducing both the barriers to entry and transaction cost in the cultivation of haricot beans. This will go a long way to increase the profit margins and thus would attract the younger and more educated population to involve in the cultivation and sale of this important crop. To enable all round production of haricot beans in the different growing areas, research base organization such as IRAD and PABRA should develop sustainable improved haricot beans varieties that are adaptable not only to the different agro-ecological zones but to the different production seasons.

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