Socio-economic characterisation of family fruit farms in the Sudano-Guinean zone of Cameroon

Comment [K1]: Characterization

ABSTRACT

Fruit growing is one of the main strategic axes for wealth creation and poverty reduction in all localities. The high Guinean savannahs of Cameroon are host to numerous family fruit farms. Unfortunately, these farms are underdeveloped. In order to improve this situation and make this sector a tool for development, the present study aims to carry out a socio-economic characterization of fruit farms. This characterization was carried out by means of producer surveys. A total of 101 growers interviewed were married (92%) and farmed 75% of the land acquired on a customary basis, of which only 11% had title to ownership. Over 65% associate farming with fruit production. The main obstacles to production are pests and diseases, and outdated production tools. Between 40% and 70% of production is lost in the field or after harvest. Fruit production on family farms can be improved by strengthening pest- and disease-resistant fruit varieties and production tools.

Comment [K2]: strategy

Comment [K3]: Income generation

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Comment [K5]: techniques

Comment [K6]: advanced production techniques

Keywords: Fruit growing, Characterization, Family farm, Fruit trees, Cameroon.

1. INTRODUCTION

The Far North of Cameroon is a region where agricultural yields and productivity remain low, and malnutrition is high due to climatic instability, declining soil fertility and an excess of population over resources [1]. The Adamawa region, in particular, is a transition zone between the humid tropical south and the dry tropical north, with diverse vegetation ranging from shrub to tree savannas [2,3]. Despite the region's potential, farm performance is low. Among the major reasons for this poor agricultural performance are the damage caused by crop diseases and pests [4,5]. Confronted with this situation, many households produce fruit crops on their farms, which represent an important socio-economic stake and are renowned for their medicinal properties [6,7,8]. Despite the enormous nutritional potential of fruit, consumption levels are below 70 kg/capita/year, the standard set by the FAO [9]. In order to improve fruit production and give this activity a chance of success in the Adamawa region, a characterization of fruit-based farms is needed to promote a better understanding of them. The aim of the present work is to characterize fruit farms in a number of localities in the Adamaoua region.

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2. MATERIAL AND METHODS

2.1 Description of the study area

The present study was carried out in five departments of Adamaoua (Fig. 1). They belong to the agro-ecological zone of the Guinean High Savannah, which covers most of the Adamaoua Plateau. It stretches for around 400 km between Nigeria and the Central African

Republic, and culminates at 2,460 m above Tchabbal Mbabbo [3]. The area is characterized by a Sudano-Guinean climate, with rainy and dry seasons [10]. Cattle breeding is the region's economic activity par excellence [11].

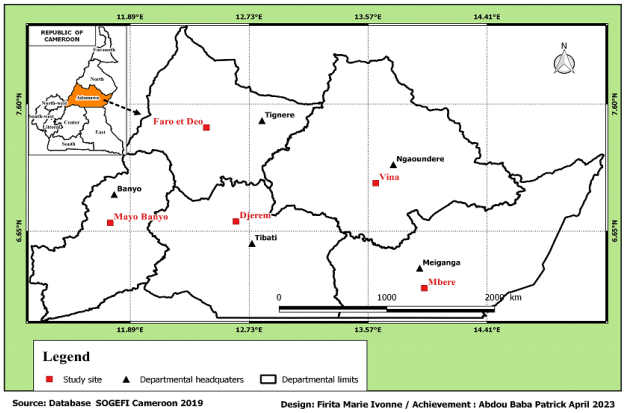

Fig. 1. Study site location map

2.2 Description of the study area

A survey was carried out using semi-structured interviews with 101 farmers. The main sections dealt with the socio-economic characteristics of fruit growers, farming methods and production losses. In order to ensure efficient collection of information across the region's five departments, the work was organized so as to collect information from the whole region at the same time. In Vina, the focus was on mango-based production systems.

2.3 Data analysis

Sphinx plus version 5.0 allowed the codification of questions. Excel of Microsoft Office 2010 was used for calculations and graphing.

3. RESULTS

3.1. Stakeholders in family fruit farms

3.1.1. Gender and marital status

In the Adamawa Region, agriculture is a family-centered activity. Men (93%) are more active in fruit production than women (7%). This activity is the responsibility of married heads of household (92%). Figure 2 shows that few single people : widows or widowers and bachelors are involved in fruit production.

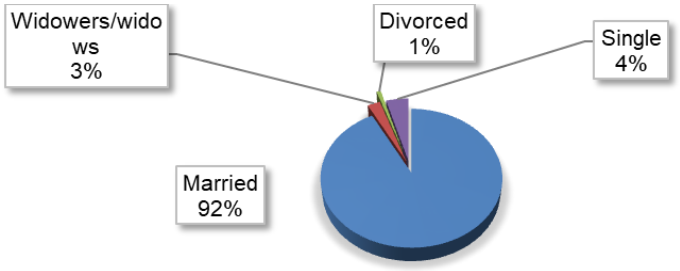

Fig. 2. Presentation of the marital status of rural actors in Adamawa

3.1.2 Age of growers

Producer ages ranged from 30 to 90 (Fig. 3). The most represented age group was [30-50[, at 47.72%. The [50-70[age group came second with 25.66%. A further 15.36% of operators are between [70-90] years of age. Only 11.34% of operators are under 30 years.

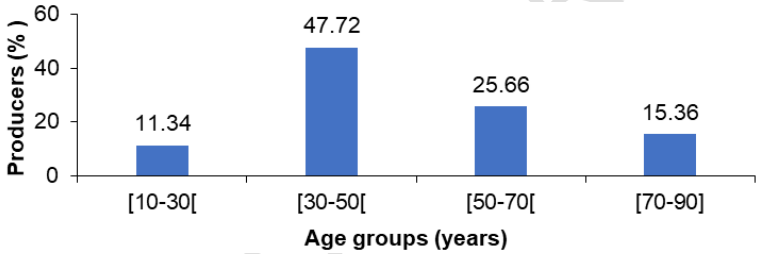

Fig. 3: Distribution of producers by age class

3.1.3 Main activities

At farm level, agriculture and livestock farming account for over 75% of the rural workforce in Adamaoua. To improve their family incomes, producers in Adamaoua multiply the activities on their farms (Fig. 4). While agriculture remains the main activity (55%), livestock farming is the second at 19%. Livestock farming is combined with agriculture on 11% of farms, and fishing on 1%. Other activities, such as hunting and petty trading, occupy 14% of the rural population in Adamawa.

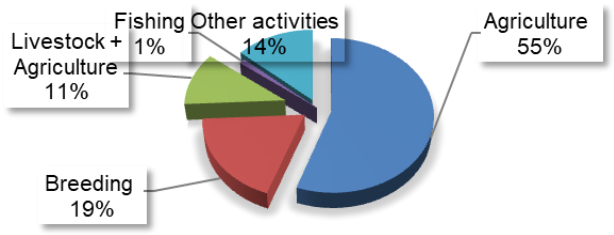

Fig. 4. Major activities of farmers

3.2 Functioning of family fruit farms

3.2.1. Land use

Indeed, the plot is not only used for fruit production, but also for other activities. 68% of fruit growers cultivate other crops on their plot, and 10% also keep livestock (Fig. 5). On the other hand, 22% of growers do not grow any agricultural crops on their plot. This practice of farming or raising livestock on fruit plantations enables growers to increase their income.

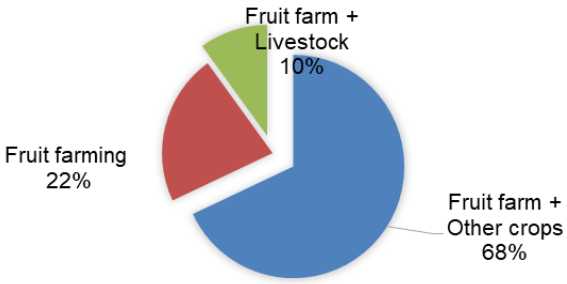

Fig. 5. Diversity and importance of activities carried out on farms

3.2.2. Land acquisition

One of the main constraints to land use in Adamawa is the availability of land and, above all, the farmer's ability to enjoy it without the risk of expropriation at any time. The vast majority of farmers (75%) farm land acquired by family inheritance or custom (Fig. 6), which is a factor of precariousness.

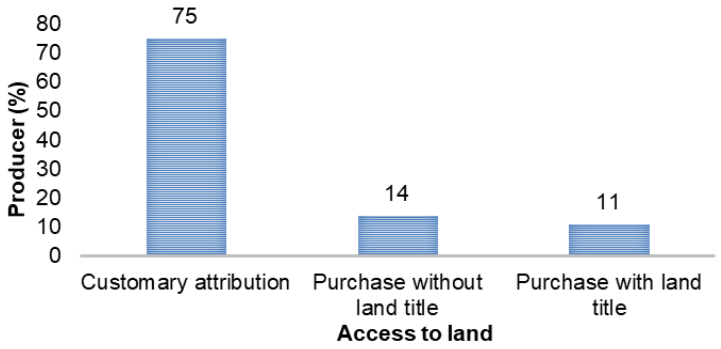

Fig. 6. Methods of acquiring a plot of land for farming

Few farmers (11%) have legal ownership of their land, as they possess a title deed or registration. Purchases of unregistered land have been observed, which is sometimes a source of conflict.

3.2.3. Production improvement techniques

Agricultural production in general, and fruit production in particular, is being improved in the rural areas of Adamaoua thanks to two main approaches: the sowing method to maximise growth and the choice of varieties.

3.2.3.1. Fruit tree planting method

Two methods of planting fruit trees (Fig. 7) were identified in the various localities: direct seeding and transplanting nursery seedlings into the field. More specifically, the nursery planting method is the most widely used (77%) and, according to good practice, is the one that maximizes the planting of the best-performing seedlings.

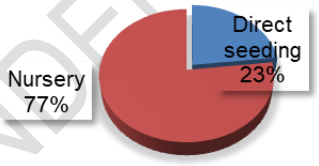

Fig. 7: Method of planting fruit trees

3.2.3.2. Choice of planting material

Adamaoua growers show a strong preference for improved varieties (Fig. 8). 81% of growers choose selected plants for their plots, compared with only 19% who still plant unmodified plants.

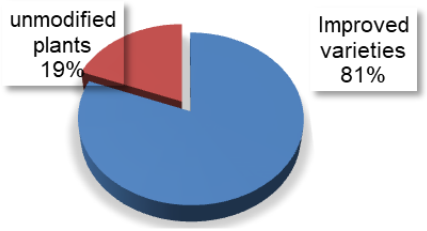

Fig. 8: Origin of fruit tree seeds

3.2.4. Production tools on farms

To carry out arboricultural activities, several production tools are used by growers, depending on the means at their disposal (Fig. 9). The hoe (47.95%) and the machete (23.28%) remain the tools most frequently used in this production system with very few resources.

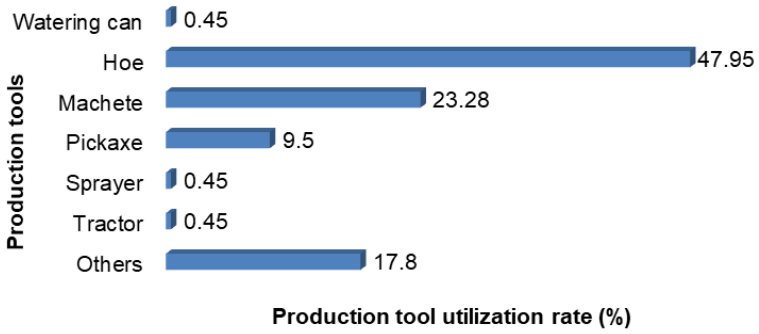

Fig. 9. Diversity and importance of agricultural production tools in the farms

3.2.5. Agricultural workers

In addition to available family members, family farms are occupied by available, inactive or unemployed people looking for odd jobs. It is therefore common in this situation for the entire workforce to be unskilled (89%). This workforce may be family or external. The use of labor depends on the farmer and the means at his disposal.

3.2.6. Farm production orientation

Producers do this to feed their families, but above all to earn a living. Much of the produce is sold on the local market. Over 80% of the fruit produced in the fields is sold.

Sold as seasonal products, 24 local speculations are available on the local market, including a wide range of fruits (Table 1).

Table 1. Market value of some crops produced on family farms in the Adamawa Region

Scientific names	Family	English names	Sales unit	Price (Fcfa)
Pineapple comosus	Bromeliaceae	Pineapple	Fruit	850
Arachis hypogaea	Fabaceae	Peanut	Seeds/Bag 100 Kg	30.000-35.000
Persea americana	Lauraceae	Lawyer	Fruit	50-100
Musa balbusiana	Musaceae	Bananas	Diet	500-700
Theobroma cacao	Malvaceae	Cocoa	Seeds/Bag 100 Kg	1500
Coffea arabica	Rubiaceae	Coffee	Seeds/Bag 100 Kg	1.000
Saccharum officinarum	Poaceae	Sugar cane	Stipe	100
Citrus limon	Rutaceae	Lemon tree	100 Kg bag	10.000-12.000
Annona muricata	Annonaceae	Soursop	Fruit	300-350
Abelmoschus esculentus	Malvaceae	Okra	100 Kg bag	7.000
Phaseolus vulgaris	Fabaceae	Bean	100 Kg bag	30.000
Xanthosoma sagittifolium	Araceae	Macabo	50 Kg bag	15.000
Zea mays	Poaceae	Corn	100 Kg bag	14.000-15.000
Manihot esculenta	Euphorbiaceae	Cassava	100 Kg bag	9.000
Citrus reticulata	Rutaceae	Mandarin	100 Kg bag	5.000-10.000
Mangifera indica	Anacardiaceae	Mango	Fruit	25-50
Citrus sinensis	Rutaceae	Orange	50 Kg bag	11.000 - 12.000
Citrus maxima	Rutaceae	Grapefruit	50 Kg bag	5.000 - 9.000
Carica papaya	Caricaceae	Papaya	Fruit	500 - 750
Elaeis guineensis	Arecaceae	Oil palm	Liter of oil	800
Ipomoea batatas	Solanaceae	Potato	50 Kg bag	15.000
Capsicum annum	Solanaceae	Chili pepper	15 L bucket	12.000
Dacryodes edulis	Burseraceae	Safoutier	15 L bucket	5.000
Colocasia esculenta	Araceae	Taro	100 Kg bag	8.000

Fruit is sold to retailers (66%) and wholesalers (48%). Fruit marketing flows are both internal and external. The various fruits exported are: bananas, citrus fruits, avocados, mangoes, cocoa, coffee and safou. A number of fruits are also imported into our study areas: French apples, coconuts and other citrus fruits.

3.3. Loss of agricultural production

3.3.1. Levels of agricultural production losses

Significant production losses are observed. Figure 10 shows that 96% of growers lose between 30% and 60% of their crop; 2% sometimes lose their entire production. These

losses are enormous if agriculture in general, and fruit production in particular, is to be a lever for growth and development.

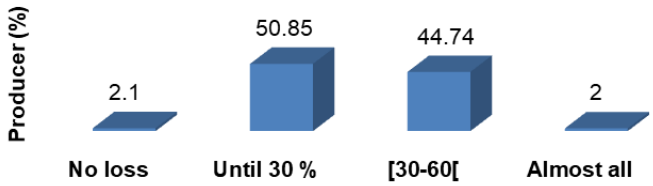

Fig. 10. Importance of crop losses due to pests

3.3.2. Production loss factors

The most important loss factors are pests and diseases, which hamper the development of fruit-growing activities. According to growers, these diseases cause fruit and blossom drop, rot and desiccation. This is why 31.48% of growers resort to phytosanitary treatments (pesticides) to limit losses and consequently reduce the drop in yield. These chemicals are purchased from speculators on local markets.

As for pests, there is a wide variety of animals that attack fruit at all stages of development. The most frequent pests are insects (35.28%) and birds (29.4%), which account for a considerable proportion of fruit losses (Fig. 11).

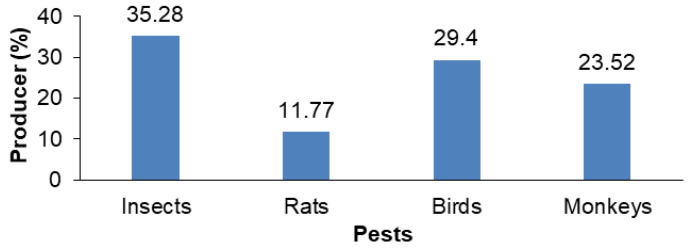

Fig. 11. Main fruit pests

4. DISCUSSION

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More than half of those questioned were men. Indeed, men, as heads of household, are the most involved in fruit farming. These results are similar to those of [12] in the northern part of Cameroon. These authors report that 98.04% of cashew plantation owners are men. The work of [13] in the main cashew-producing regions of Senegal shows a low representation of women (5%) in cashew production. The majority of respondents were married (92%). The predominance of married people can therefore be explained by the fact that fruit producers

have dependents and must therefore provide for the various needs of their households. This result is in accordance with those of [14] in Senegal, more specifically in the Groundnut Basin and Casamance, where most cashew producers are married, i.e. 93.83%, compared with 3.58% who are single, 4.48% who are widowed and 0.22% who are divorced. Most producers are between 30 and 69 years old. This age group demonstrates the involvement of older people in fruit production. This age difference could be due to the movement of young people from the Adamawa region to the North Cameroon region. The work of [15] on the diagnosis of the mode of operation and major constraints of fruit orchards and other arboricultural species in the North Cameroon region reveals that more than half of fruit producers (58.2%) have an average age of between [31-60[years. This age difference could be due to the movement of young people from the Adamaoua region in search of better living conditions, or to the fact that fruit production requires a lot of space, which explains why fruit production is mainly carried out by heads of family, and more particularly by older people.

The majority of farmers are engaged in agriculture (55%). In the North Cameroon region, 76% of farmers' main activity is farming [15]. The main mode of land acquisition by farmers is through family inheritance or custom (75%). However, the work of [16] reveals that the mode of access to land by purchase is dominant at 57.5% versus 38.30% for inheritance on the Allada plateau in southern Benin. Planting by nursery (77%) is the most common method. This result confirms the work of [17] in Casamance, where the nursery method of cashew plant production was found to be dominant. In contrast, [14] found that direct seeding is the most widely used planting method. Farmers frequently use improved varieties. This result differs from those of [18] who noted that improved varieties are little present (< 1%) in fruit farms in the peri-urban area of Yaoundé. Adamawa producer are therefore aware that these varieties would help improve fruit production. The hoe is the tool most widely used by farmers. In the North Cameroon region, most produced do not have all the equipment recommended for fruit tree production. They therefore own the sprayer, the atomizer, the motor pump, the wheelbarrow, the rickshaw, the pruning shears, the machete, the shovel, the pickaxe and the hoe [15].

Fruits are sold in units (one fruit), buckets, 50 and 100 kg bags, diets or liters of oil. The work of [19] in the North Cameroon region reveals that, depending on the species and the seller, fruit is sold in a variety of forms, ranging from single units (one fruit) to batches (bags or heaps), with prices varying from 10 Fcfa for lemons to 1,300 Fcfa for pineapples. Retailers account for 66% of fruit sales, and marketing flows are both internal and external. In the savannahs of Cameroon and Chad, regional and international flows show that large quantities of fruit circulate within and between countries in the savannah zone, with high imports of oranges from Nigeria [20].

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The most important loss factors are fruit pests and diseases. Insects are the most common pests. In the humid zone of Cameroon, pest problems are the major production constraints for almost all fruit species [6]. The work of [15] in orchards in the North Cameroon region has shown that the main production constraint is the use of local varieties susceptible to pests and diseases: whiteflies, citrus leafminers, fungal diseases, fruit flies and anthracnose are all observed. With regard to the use of phytosanitary treatments by producers in Adamaoua, this result is similar to those of [14], who revealed that 13% of producers use phytosanitary products for pest and disease control in cashew plantations.

4. CONCLUSION

This study focused on the socio-economic characteristics of family fruit farms in the Adamawa region of Cameroon. We found that plantations are mainly owned by older people, and that men are the most frequent owners of fruit production systems. The most common mode of land acquisition is inheritance (75%). Improved varieties are used by 81% of farmers. Fruit farms are a source of income for producers. In the Adamawa region, farmers produce little on their farms because of pests and diseases. The use of rudimentary production tools and the lack of skilled labour are other factors reducing agricultural production. Despite the many difficulties facing fruit production, there is significant internal and external trade in fruit. With this in mind, it would be important to estimate the carbon stored by these production systems.

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