



## Market Gardening and Poverty Reduction in Jakiri Subdivision North West Region Cameroon

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### Abstract

Poverty reduction has been one of the main objectives of major international organisations like FAO, World Bank, UNICEF and governments' especially those of Africa. This study contributes to the fight against poverty through the analysis of market gardening as a strategy to poverty reduction in the Jakiri municipality. Data were collected through household interview, focus group discussion, interview of personnel of the ministry of agriculture and rural development, councils, religious heads and local chiefs) and field observations. Data were analysed by descriptive statistics, correlation and regression. The findings revealed that 73% of the market gardeners in Jakiri subdivision did not attend secondary school, lack skills to compete for jobs in urban areas. Agriculture particularly market gardening was their major source of income generating activity as more than 75% of the household income comes from market gardening. Also, more than 80% of what is produced is sold. Moreover, 90% of the gardeners in Jakiri subdivision think that if government could help them improve on their productivity their livelihoods will improve and this will take them out of poverty. There are high expectations that the income and the number of market gardeners will rise over time and space. This can be seen by the number of farmers involved and their earning where more than 70% earn from 1,000,000FCFA and above per year, an average of 83,334FCFA and above per month. Targeted marketing development strategies need to be followed by market gardeners and various stakeholders in Jakiri to better exploit the economic potential of these crops and at the same time maintaining its contributions to the local crop diversity.

**Keywords:** Market gardening; Poverty reduction; Rural areas; Jakiri municipality; Agriculture; Income generating activity; livelihood.

### 1. Introduction

Horticultural produce and processed products from the developing world are becoming increasingly popular both in domestic and in international markets. Global production and exports are rising steadily. Horticulture can offer good opportunities for poverty reduction because it increases income and generates employment, care must be taken that small and poor farmers are not excluded from the opportunities in these market sectors. Africa's population is projected to reach 1.5 billion by 2030 and 2 billion people by 2050, the majority of which will be women and youths. This prediction alone summarises the scale of our agricultural challenges, to feed Africans, create wealth and to conserve natural resources. FAO objective for the coming decades is to ensure food security for a population that is increasing and becoming more urbanized, helping to create wealth and jobs in rural areas in particular, reducing inequalities and vulnerability, protecting environmental and human capital [1]. Thus increasing agricultural output stimulates employment in the rural areas. This in turn decreases urban poverty by mitigating rural-urban migration and lowering food prices [2]. The government of Cameroon of recent has laid emphasis on agriculture as one of the pillars for an emerging country. Achieving this goal requires not only improving the living conditions of the people in rural areas, but also assuring sustainable agriculture which is the key to sustainable economic and industrial development.

In Cameroon agriculture is the dominant primary activity and it is practiced by 80% of its population [3]. The country was ranked 152<sup>nd</sup> with respect to the Human Development Index (HDI) in 2014. With a gross domestic product (GDP) of 2002 USD per head, over 40% of the 19 million inhabitants [4] live below the poverty threshold and 70% are dependent on agro pastoral activities [5, 6]. Cameroon produces and sale both export and food crops through government corporations like the Cameroon Development Corporation (CDC) or by individuals who carryout peasant agricultural production. However, this activity has been largely affected by oscillations in the local climatic elements especially rainfall and temperature which have effects on both plantation and peasant agriculture [7]. Low-income farmers account for most of the staple food that feeds the country. A very significant proportion of

the national food production by these farmers is also sold to the neighbouring countries. The success of Cameroon's agriculture is thus not only important for the producers and the nation, but has a significant impact on the Right to Food for the Central Africa sub region [8]. Thus agriculture plays a pivotal role in poverty reduction especially in rural areas.

Poverty alleviation is a major agenda for sustainable development in developing countries like Cameroon. However, the agenda of poverty alleviation not only includes the income raising activities but also constitutes the broadest opportunities in the socio-economic development of countries worldwide. Poverty itself is a problem of both developed and developing countries, but the level of poverty with its magnitude is different in countries worldwide [9]. Globally, extreme poverty continues to be a rural phenomenon despite increasing urbanization. Of the world's 1.2 billion extremely poor people, 75% live in rural areas and for the most part they depend on agriculture, forestry, fisheries and related activities for survival. Moreover, poverty is the oldest and the most resistant virus that brings about a devastating disease in the third world or developing countries. Its rate of killing cannot be compared to any disease from the genesis of mankind. It is worse than malaria and HIV/AIDS which are claimed to be the highest killer diseases and even worse than Ebola [10]. IFAD estimated in 2001 that among the poorest 1.2 billion people in the world, surviving with less than a dollar per day, three out of four lived in rural areas. They constitute the poorest fifth of world population and do not earn enough to cover their food needs. Some rural farmers have adopted market gardening as a means of livelihood since it provides them with daily income and food.

Market gardening is a highly specialised form of agriculture. Evolving from subsistence farming, the practice of market gardening has been around for centuries and overtime has become an important aspect of agriculture (environmental and socio-economic). Among various economic and social benefits, market gardening has a vital and multifaceted role in providing food security, meeting the demands of consumer markets, utilising labour and generating income [11]. In Cameroon, market gardening is highly practiced on the Bamboutos Highlands, the slopes of Mount Cameroon, the Mungo and Benue Depressions, the Foubot plains, the Bamenda Highlands with Jakiri subdivision inclusive. The principal crops include green beans, carrots, lettuce, cucumber, cabbages, spices, tomatoes, potatoes and vegetables under ample precipitation conditions [12]. Market gardening becomes significant in Cameroon and in North West in particular in the early 1990<sup>s</sup> after the fall in prices of cash crops (coffee) in the world market. The trade of fruits and vegetables is also growing due to increasing urban demand and the emergence of intra-regional markets with neighbouring countries namely Gabon, Congo, Equatorial Guinea, Republic of Congo, Chad, Central African Republic, and Nigeria. Fruits and vegetables contribute to economic development. The value of the final production of fruits and vegetables was 154 billion CFA francs (3% of GDP) in 1998. This represents approximately 22.9 % of the total agricultural production in Cameroon, with an annual growth rate of 2.7 % per year [13]. IRAD [14], suggested that vegetable generated 98.5 billion CFA France. The new rural sector development strategy adopted by the Cameroon government aims to ensure food security and self-sufficiency for households and the nation; contribute to economic growth and particularly, the growth of foreign trade and employment; increase the incomes of rural producers, improve the living conditions of the rural population, and ensure better use and sustainable management of natural capital as a production base [15]. If Cameroon maintains its position as the "bread basket" of the Central African Sub Region today, one of the areas to be credited for this is the Jakiri subdivision the food produced in Jakiri Sub division especially market gardening crops, is not only consumed in the North West Region but in other parts of Cameroon.

The promotion of the rural economy in a sustainable way has the potential of increasing employment opportunities in rural areas, reducing regional income disparities, stemming pre-mature rural-urban migration, and ultimately reducing poverty at its very source. In addition, development of rural areas through agriculture and especially the cultivation of food crops may contribute to the preservation of the rural landscape, the protection of indigenous cultures and traditions [16]. The countryside which was home to 85% of the poor in 2001 harboured slightly over 89% of the poor people in 2007. This rise in the number of poor people, especially in rural areas, confirms the fact that programs (coffee cooperatives) that were designed between 2003 and 2006 to increase rural incomes through better yields and higher agricultural production had not produced the desired results [17]. Some farmers in Jakiri subdivision have adopted market gardening as a means of improving their households income.

Internationally, the exchange of fruits and vegetable (75 million tons) is in the rise and accounts for more than 55 million USD which corresponds to 15% of the world exchange in food products. Millions of tons of fruits and vegetable (transformed and fresh) are produced worldwide with vegetable accounting for 55% of the total production. It has been described as "one of the most productive farming systems in Africa". In their agricultural development policies and programmes, governments invariably recognise that increasing food production in rural areas, and alleviating rural poverty, depend on giving farmers access to land and water, credit, higher-yielding crop varieties, farm inputs, agricultural extension, agro-processing and markets. They also stress the need to ensure women's access to all of the above [18]. Although the importance of agriculture is in the rise this activity in Jakiri subdivision faces a number of problems such as; poor farming methods, inadequate inputs, water shortages, pest and diseases, poor marketing structure, loss in soil fertility, climate variability etc. All these factors are reducing the role play by market gardening as an income generator in this area. Hence, there is need to study the effects of these problems on market gardening in Jakiri subdivision. Market gardening plays an important role in poverty reduction and food security in rural areas and requires less land.

In the grass field region of Cameroon and particularly Jakiri subdivision, the land tenure systems range from inheritance, renting and ownership, with the state and traditional rulers having exclusive rights over most lands and will sell or distribute without due consideration given for agricultural purposes. This leaves some farmers with large surfaces of land and others with very small sizes. Also, the rapid population increase (growth rate of 2.9% [19]) is

also putting much pressure on the land. This is seen in the increase in demand for land use for developmental projects (schools, roads, churches, houses, hospitals, markets and so many others). Inadequate infrastructure is a major hindrance for market gardening in Jakiri subdivision.

Poor farm to market roads and the inadequate modes of transportation are also a serious problem. Roads leading to areas of production are deplorable. There are only seasonal roads. Transportation cost is really a handicap to producers and most especially when fuel prices are rising February 2008 and June 2014 (personal observation). Farmers pay very high for finish product to arrive in various village squares. More so, the absence or poor storage facilities, improved species of seeds and other farm inputs are a big handicap in Jakiri. Production and marketing of these crops is personal that is, farmers do not have Common Initiative Groups which makes it difficult to benefit from Government, NGO, Elites and others stake holders.

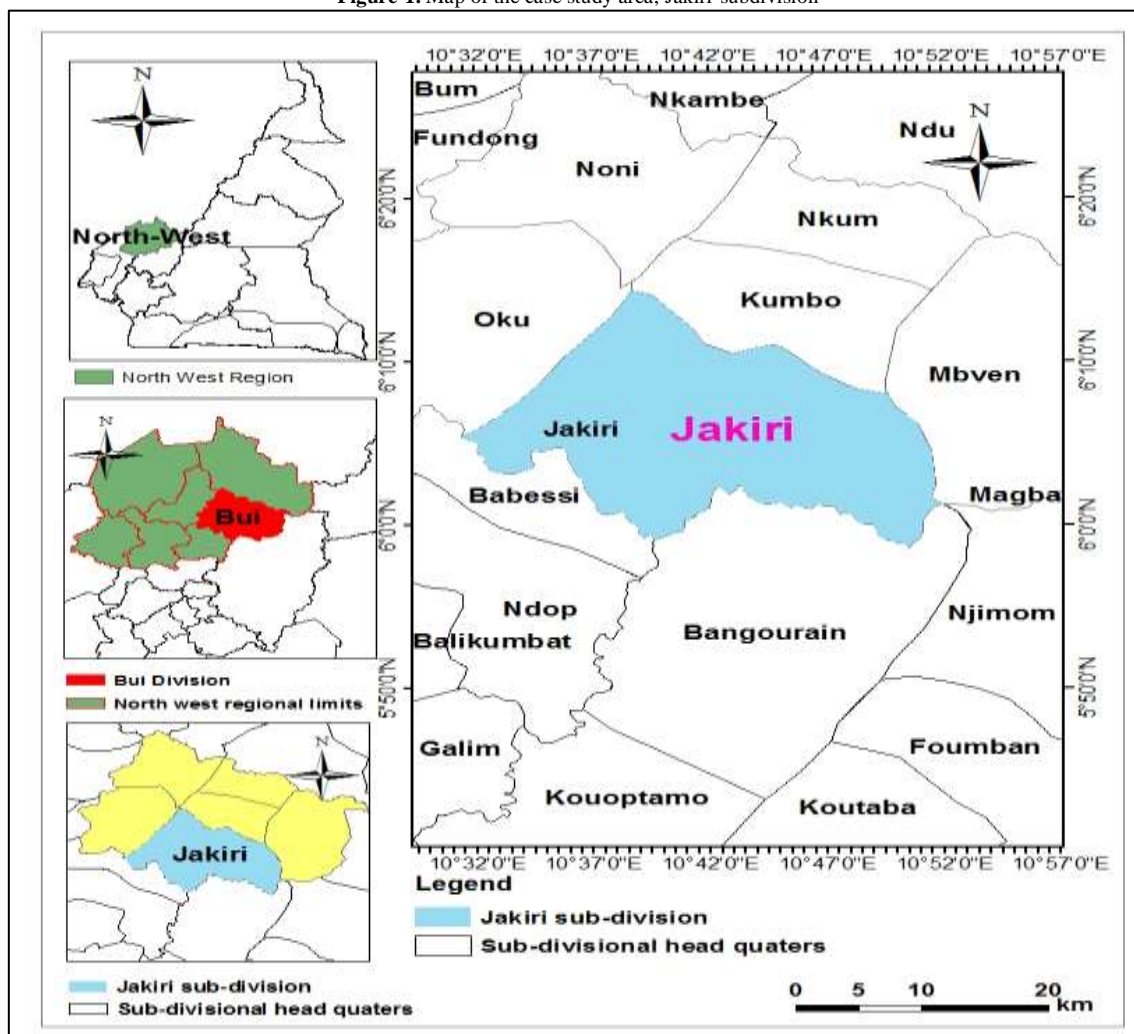
Hence the main orientation of this work was aimed at considering market gardening as a means to poverty reduction in Jakiri sub division. Today, about 767 million people continue to live in extreme poverty. Roughly, two thirds of the extreme poor live in rural areas, and the majority are concentrated in Sub-Saharan Africa and South Asia (World Bank, 2016). most developing countries, particularly in Sub-Saharan Africa and South Asia, where poverty and hunger are most prevalent [18]. Investments today need to take into account natural resource conservation and sustainable agricultural production, including investing in climate-smart technologies [20]. Each country and region will have to evaluate its own pathways out of poverty; however, country experiences suggest that both social and economic interventions are equally important in reducing poverty [21]. This should include a combination of social and economic policies that address today's challenges and enable and empower rural people to earn a living and shape their livelihoods [22].

## 2. Materials and Method

### 2.1. Localization of the Study Area

Jakiri Sub-Division is located between latitude  $6^{\circ}00'$  and  $6^{\circ}10'$  North of the Equator and longitude  $10^{\circ}31'$  and  $10^{\circ}48'$  east of the Greenwich Meridian (Figure 1). She is characterized by two major seasons, the dry (from mid-October to mid-March) and wet seasons (from mid-March to mid-October). Average annual rain fall ranges between 1500mm – 2000mm, while mean monthly rainfall varies between 0-500mm.

Figure-1. Map of the case study area; Jakiri-subdivision



## 2.2. Methodology

The sampling procedure of this study was purposive and the simple random sampling. In this case samples of 100 gardeners were selected from the study population in the ratio 1: 3.3. Table 1 shows how farmers were selected per village.

**Table-1.** The distribution size of questionnaires per village

Village	Frequency	Percentage
Vekovi	33	33.0
Wvem	27	27.0
Yer	18	18.0
Nkar	12	12.0
Wainamah	10	10.0
Total	100	100.0

Data were collected through one-on-one interviews with market gardeners, focus group discussions, farmers groups, religious bodies (catholic, Baptise, Presbyterian, Muslims), “buyam-sellams”, restaurant operators’, personal field observations and distribution of questionnaires to those concerns(MINADER officials, local council officials, land owners, local chiefs and notables). Data were analysed quantitatively, correlation and regression and treated using SPSS.

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## 3. Results and Discussion

### 3.1. Socio-Economic Characteristics of Market Gardeners and the Characteristics of Market Gardening

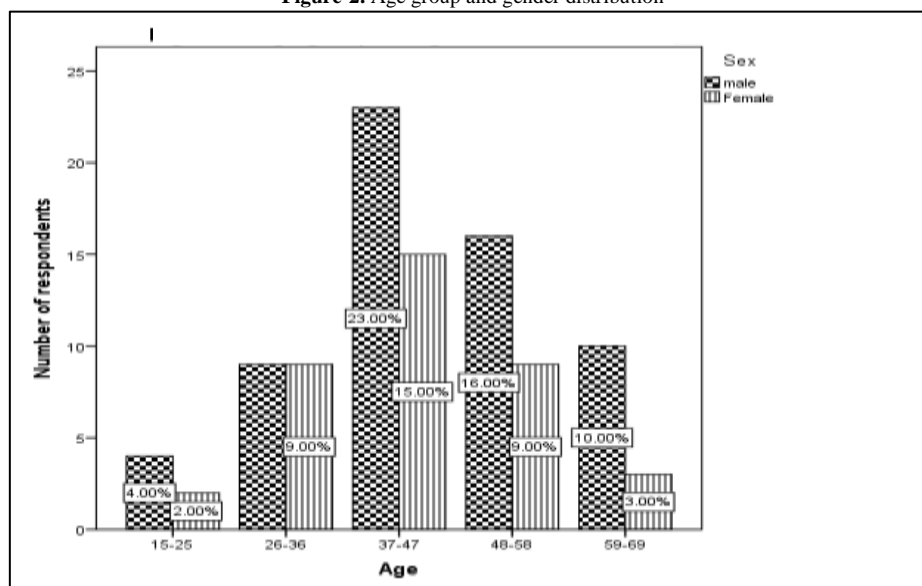
#### 3.1.1. Socio- Economic Characteristics

More than 75% of the people in Jakiri sub-division are engaged in agriculture as it is the main economic activity of the people [23]. 100 market gardeners were interviewed from five villages and the results show the heterogeneity in social characteristics of the producers. These results were grouped and presented in the following headings; age group and sex, family status, number of people per household (HH), level of education and previous employment.

#### 3.1.2. Age Group and Sex

The average age of the gardeners was 43.87 years, with a mode of 42 years. The youngest market gardener was 18 years and 22years for male and female respectively. The oldest was 61years for male and 60years for female. In general, most market gardeners in Jakiri subdivision were middle aged Figure 2.

**Figure-2.** Age group and gender distribution



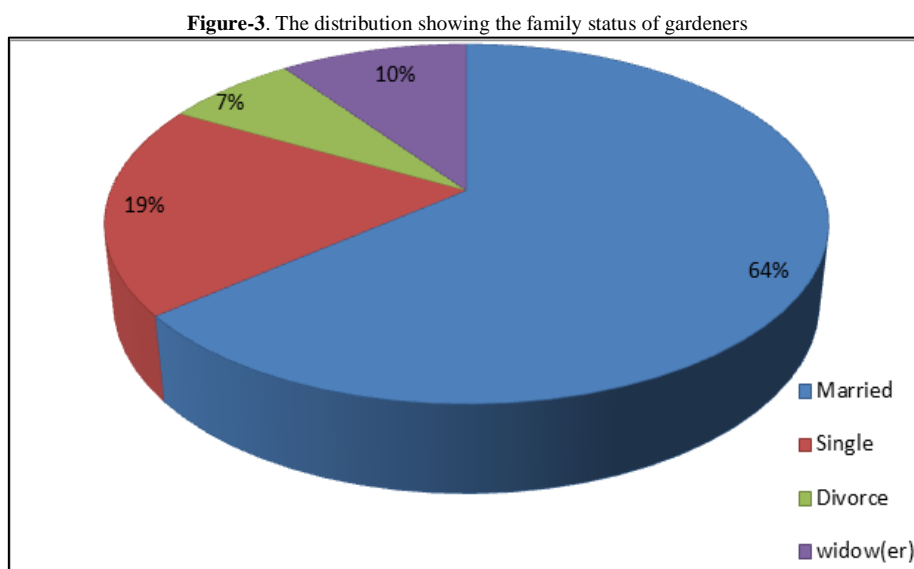
In Jakiri subdivision, men are more involved in the production of vegetables. Out of the 100 gardeners that were interviewed 62 were men and 38 were women (table 4). Women also produce vegetables in small quantities as compared to men. As seen figure 2 a greater number of market gardeners in Jakiri subdivision belong to the active age group ranging between 26years to 58years and account for more than 80% of market gardeners in this area. The

low involvement of the aged and the young in market gardening is because this activity is labour intensive and requires a lot of energy which children and the old cannot supply. There were only two girls below the age of 25. The low level of involvement of children below 25 years is as a result of an increase in the number of children in secondary schools. This is because of the increase in the number of schools in villages.

The age group 26-36 is the highest mobile group. At this age most youths migrate out of Jakiri subdivision in search for greener pastures and the desire to attain higher levels of education. The age group 37-47 is the most active and have huge financial responsibility ranging from taking care of their aging parents, children, in-laws, junior ones and planning for their future after retirements. This explains why they constitute the highest number of market gardeners in Jakiri subdivision. The age group of 59-69 are mostly retired people that were working in plantations in the coast and produce at very small scales just to feed their grandchildren and keep themselves busy. During discussion with one of them he told us that "I practice market gardening because I love and feel better in a green environment and that's why I practice it at a small scale just beside my house". According to him market gardening is a means of beautifying his environment.

### 3.1.3. Family Status

Out of the 100 market gardeners interviewed, 64 were married, 19 single, 7 were divorce and 10 were widows and widowers (figure 3).



The results shows that married people (64%) in Jakiri subdivision are more in market gardening and those who are divorced are least that is 7%. This is because market gardening is labour intensive and required greater attention. This can be attributed to the saying "two hands are better than one". Married people are stable, have a greater access to land and also have a greater financial responsibility as compared to those who are single. Out of the seven divorced people five were women and two men. In Jakiri subdivision when a woman divorce it becomes difficult for her to remarry but tradition and some religious groups (muslems) permits men to have as many wives as possible though this phenomenon is fast dying down due to increasing Christianity, the number of Christians and the desire for better living conditions in this area. Equally, we found out that there were more widows involve in market gardening as compared to widowers though they produce mainly for consumption.

### 3.1.4. Household Data

Out of the 100 farmers two lived alone and represented the smallest households. The largest household had 9 occupants comprising the respondent and his wife, mother in law, 4 children, and 2 grandchildren. It is common for the people of Jakiri to live with extended family members. (Table 2)

**Table-2.** Household size of gardeners

Number of persons per household	Frequency	Percentage
1	2	2.0
2	4	4.0
3	10	10.0
4	18	18.0
5	17	17.0
6	27	27.0
7	14	14.0
8	7	7.0
9	1	1.0
Total	100	10.0

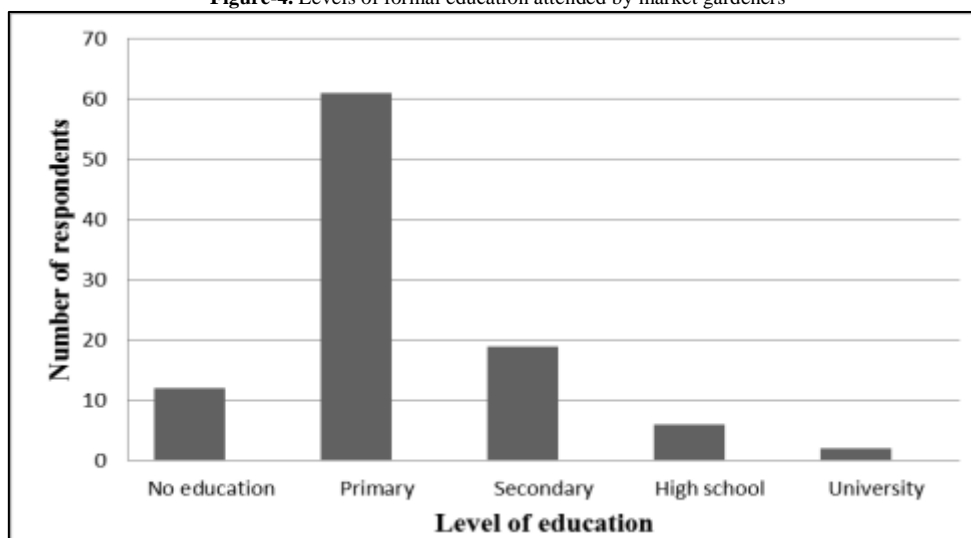
Out of the 100 gardeners interviewed their households had between 1 and 3 male adults, 1 and 4 female adults and between 0 and 6 children. In Jakiri municipality, Women are helped in their farm task by the children and the men in the clearing and harvesting. However, men in Jakiri subdivision nowadays have extended their participation in farm work by tilling and weeding especially during seasons of high labour demand. The consciousness of men to participate in the vegetable production is an indication of change which has come as a result of unemployment, population growth and increase in the demand for vegetables and a fall in the prices of cash crops (coffee).

Some gardeners had children who were not living at home because they were undertaking studies in urban centres (Kumbo, Bamenda, Dschang, Yaounde, Douala etc.), other villages and even abroad. Also, some respondents did not have children to support them in the farms, because they had grown up and established their own families and employment in urban areas. These grown up often sent remittances to their parents. Part of the money they sent home sometimes is used to buy farm inputs especially chemicals which according to them these chemicals are expensive.

### 3.1.5. Education

The educational level of the gardeners in Jakiri is relatively low. Out of the 100 respondents that were interviewed, 61% attended primary education, 19% attended secondary education, only 2% with higher education and ended at the Bachelor level and 12% have no formal education. One of them attended standard system of education but this research considered it as primary equivalence. Figure 4 below shows the graphical representation of the level of education of the gardeners in Jakiri subdivision.

Figure-4. Levels of formal education attended by market gardeners



Although many of the gardeners in Jakiri subdivision commenced formal education, often secondary and high schooling were not completed. Only 8 out of 19 gardeners who attended secondary School completed form five. Only 2 out of 6 gardeners who attended high School obtained GCE Advance Level. The two that attended higher education obtained Bachelor degrees and all of them were men, however some respondents with previous employment received occupational training.

### 3.1.6. Previous Employment

Gardeners were asked to describe their previous occupations. The results obtained are presented in table 3 below.

Table-3. Previous employment of the respondents

Previous Employment	Frequency	Percentage
None	9	9.0
Cash crop producer	18	18.0
Cereal farmer	32	32.0
Bike rider	5	5.0
Palm wine tapper	14	14.0
Rearing	7	7.0
Business	5	5.0
Others	10	10.0
Total	100	100.0

The most striking finding was that 32% of them cultivated cereals (beans and maize) as their main farming activity. Their reasons for reducing the production of cereals was the loss in soil fertility leading to low yields since population is increasing and shifting cultivation is becoming almost impossible. Also the desire to diversify their

sources of income was one of the main reasons that they engaged in market gardening. Only 5% of the gardeners had trade as their previous source of income. The 9 people that had nothing doing before engaging in market gardening were young and of school age and most often were school drop outs. There were two teachers one retired and the other still in service. Increased in population and a high demand in land for construction, farming and the increasing farmer grazer conflicts push some to engage in market gardening and intensive rearing. These rearers used the waste from animals and grow vegetables. Out of the seven 4 were from Vekovi the most populated village in Jakiri subdivision.

These findings in Jakiri subdivision suggest that market gardening is adopted as a means of livelihoods improvement to rural economies. Market gardening provides a livelihood for the population lacking suitable employment skills and education to attain alternative employment in any urban environment.

The cultivation of food crops in any given location is a function of human factors, soil type, relief and climatic conditions. This explains the disparity in the production of food crops in Jakiri Subdivision. The low lands have alluvial soils which favour the cultivation of grains and pulses such as rice, groundnuts and beans. Whereas high lands such as Tarshem, Mvem, Vekovi, Yer and Nkar are characterised by cold climatic conditions together with organic deep soils that favour the cultivation of market gardening crops such as tomatoes, cabbage, carrots and huckleberry [24]. To this effect market gardening in this subdivision have some characteristics peculiar to this activity since it is still a relative young activity. 100 gardeners were interviewed and these activities were grouped and analyse in the following headings; Cultivation methods and tools used, types of crops produced, farm inputs, land tenure and land usage, irrigation schemes, number of years involve in market gardening and sources of capital.

### 3.2. Cultivation Method and Tools Used

Vegetable growing have different methods of cultivation. However, the following procedure of cultivation is common to market gardeners in Jakiri subdivision. Apart from potatoes and carrots the cultivation of vegetable in Jakiri subdivision usually passed through two main stages. The first stage involves the nursing of the seeds on a piece of hanging nursery or on a piece of land while the second stage involves the transplanting of the young crops on another field. Starting with the first stage, a piece of hanging nursery (figure 5) made of raffia palm bamboos or plank is nailed and well fertile soil is well filled inside (reasons for this nursery is for the plants to breath easily, avoid water stagnation in the soil), the seeds easily anchor very well on the ground. After that, the seeds are then nursed on the hanging nursery and this is made successful with the use of manure such as fowl droppings and or cow dung. When the plants germinate they are covered with a net or dry palm fronts to avoid direct contact with rain and sun light. After a period of time usually three weeks weeding is done by carefully removing the grass with the hand and fertilizer applied for those using fertilizers. It is then allowed for another period of one month and the young plants are ready for transplanting. Some gardeners are specialists in nursing and nursed and sell to other gardeners lacking this knowledge.

Figure-5. A hanging nursery for preparation of seedlings



The second stage involved the preparation of the land by ploughing and applying manure organic or inorganic. Farms are cleared with cutlasses or even weeded with the hands and beds are constructed using hoes. Thus there is total absents of mechanized market gardening in Jakiri subdivision.  $\frac{3}{4}$  of the farms are located far away from homes. After the construction of ridges planting, on-going weeding and spraying with chemicals (pesticides, insecticides and fungicides) is then followed. At this stage farmers do not have any uniform activities in the farm; each farmer follows the growth of his crops and determines which activity to be under taken. Crops are then harvested after a certain period and taken to the market and home for sell, consumption or short term storage. Depending on the vegetable type, crops usually take between 1 month (huckleberry) and 4 months (cabbage,

tomatoes, carrots and potatoes) to mature **Figure 6a, b and c**). This is relatively short term compared to cereals and cash crops, which could take from 6 months (maize) to 10+ years (cola nuts).

**Figure-6.** Stages involved in the cultivation of market gardening crops



Farmers in Jakiri have two forms of cultivation mono and mixed cropping (plate 2). Vegetables are very delicate in their production and need a special care. This is to avoid losses, also the chemical used for the cultivation of one crop is not applicable to another vegetable or the way they nursed also differs. The production of vegetables is mostly an intensive and a monoculture; determined by farm sizes. Farm sizes are relatively small due to population explosion, different inputs and seasons of cultivation. As a result of shortage in fertile land at times farmers in Jakiri mixed cereals crops for example maize with some market gardening crops like Irish potatoes and tomatoes.

**Figure-7.** Systems of cultivation in Jakiri municipally

**Figure-7a.** Monoculture of carbage





Figure-7b. Polyculture of maize, beans and potatoes



### 3.3. Crops Grown and Sold in Jakiri Subdivision

A relatively restricted number of crops dominate market gardening activities in Jakiri municipality. The common crops grown for sale or consumption by the respondents are listed in table 4 below according to their level of importance. Their English name and the botanical names are provided.

Table-4. Common market gardening crops grown in Jakiri subdivision

	Common name	Botanical name
1	Tomatoes	Lycopersicon esculentum
2	Irish Potatoes	Solanum tuberosum
3	Cabbage	Brassica oleracea
4	Onions	Allium cepa
5	Huckleberry (small leaf cultivars)	Solanum Scabrum
6	Carrots	Daucus carota
7	Leeks	Allium ampeloprasum
8	Bitter leaf	Vernonia amygdalina
9	Water leaf	Talinum triangulare
10	Pumpkin	Cucurbita moschata
11	Celery	Apium graveolens
12	Parsley	Petroselinum crispum
13	Sweet Pepper	Capsicum annum
14	Water Melon	Cucumis melo

Source: Adapted from Berinyuy and Fontem, 2011

The most popular vegetables grown by market gardeners in Jakiri include; tomatoes, cabbage, carrots, huckleberry and green spice (leeks, Parsley, celery and curry). The main reasons for growing the above vegetables are that, they are easy to grow and maintain. Vegetables in high demand generated good prices and profits. What favours the cultivation of vegetable (huckleberry, cabbage, bitter leaf and pumpkin) (figure 8) in Jakiri is that, these vegetables are complements to corn-fufu which their traditional meal.

Figure-8. Samples of some of market gardening crops cultivated in Jakiri subdivision

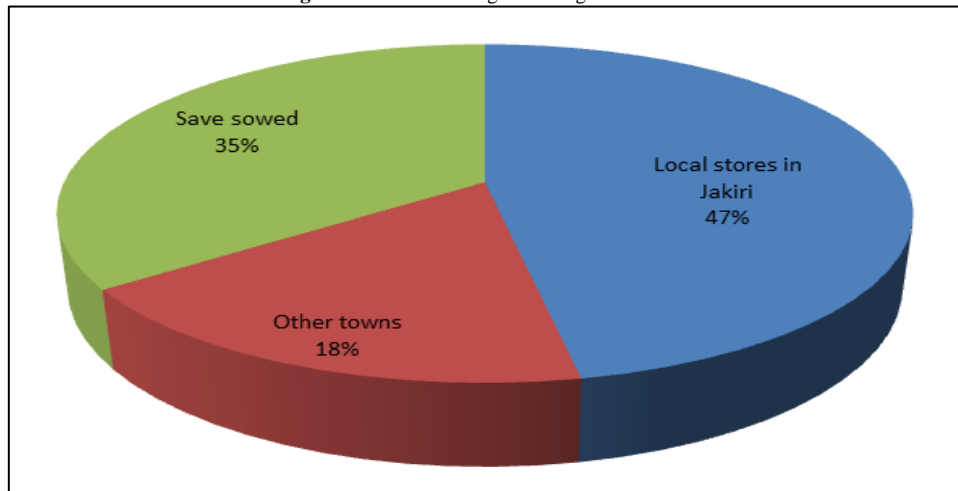


### 3.4. Farm Inputs

Market gardeners were asked to describe the types of farm inputs they usually apply in their farms. These results were grouped and analysed under the following; places where farmers take their seeds, the kind of manure used and the use of other chemicals.

The productivity of market gardening crops in Jakiri subdivision is held back by an insufficient improved species of seeds. Out of the 100 of them 47% buy their seeds from local stores in Jakiri, 35% sow save seeds and only 18% gets their seeds from other towns (Bafoussam, Foubot and Bamenda) outside Jakiri (figure 9).

Figure-9. Places where gardeners get their seeds



As seen in figure 9 above most gardeners in Jakiri either plant save seeds or use whatever they can find in local shops. Even those who buy their seeds from other towns complain they are expensive and do not produce the same like they do in those towns. This is as a result of differences in climate and soil types. There are no research institutions for producing improved species that can better adapt to the local environment. Thus most farmers using save seeds complained that they do not have confidence with seeds in the market and particular those seeds in local stores and prefer to sow save seeds though of low quality and hence low production. Many growers have had bad experiences with low quality seed carrying fake certification.

Reliable sources for the supply of farm inputs like fertilizers, fungicides, herbicides and insecticides that are very important in market gardening are very limited in Jakiri subdivision. Thus farmers usually make their own arrangement and that is why the application of these inputs is still limited in Jakiri subdivision. There are no farmers groups to buy in bulk at reduced prices and no NGOs to help gardeners get these inputs. Hence farmers complained of high prices of these inputs. Even farmers who can afford these inputs do not know the proper way of application as they have never received any training or advice on the proper application of chemicals. Out of the 100 gardeners interviewed 13 use only organic manure, 27 use only chemical fertilizer, 57 uses both and 3 uses nothing as seen on table 5 below.

Table-5. The distribution showing different kinds of manure used

Kinds of manure	Frequency	Percentage
Organic	13	13.0
Chemical fertilizer	27	27.0
Both	57	57.0
None	3	3.0
Total	100	100.0

The use of organic manure is still high in Jakiri though it is decreasing at a very fast rate. In as much as the use of animal waste and compose manure is good, in Jakiri animal waste is not often fully decomposed before application and can affect plant growth and increase the risk of contamination of produce. Animal waste that farmers use often in Jakiri includes: fowl droppings (gotten from Foubot and Bafoussam), goat dropping (from Babessi), and cow dung and to a lesser extent waste from piggeries. Some farmers can use up to one ton of fowl dropping per year. Another kind of organic manure used is compos manure which is mainly leaves from cola nuts trees (figure 10).

Figure-10. Leaves from cola-nuts trees (Organic manure)

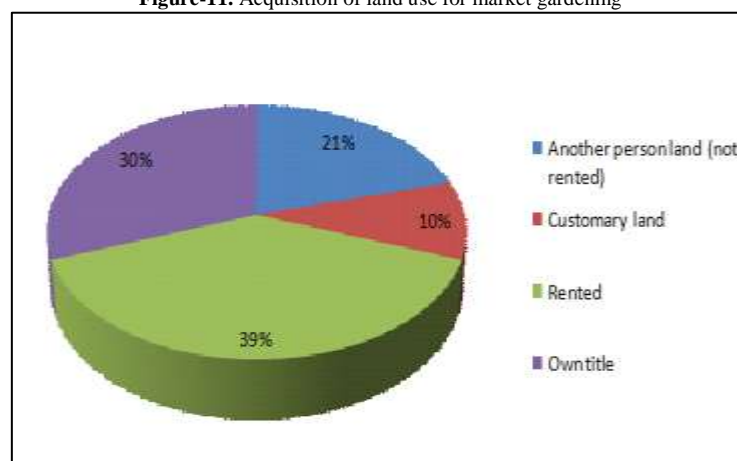


### 3.5. Land Ownership Area and Usage

#### 3.5.1. Land Ownership

The majority of gardeners in Jakiri subdivision operate in land they do not own under a variety of temporal arrangement ranging from renting to other persons land and customary land given only for a period which is usually very short for temporal cultivation. Many of them do not own title and their contract can be terminated and crops destroyed with little or no compensation when developmental projects like building a school, hospital or road construction are taking place. Out of the 100 gardeners interviewed 34 own land titles and out of the 34 that own land titles 11 inherited. Land is acquired in Jakiri in different ways as presented on the figure 11 below. Note some farmers had two pieces of land acquired in two different ways like purchased and rented and were counted twice.

Figure-11. Acquisition of land use for market gardening



In the majority of cases land was acquired by renting and private purchase, granting market gardeners the property rights and freedom to use the land at their discretion. Customary lands in Jakiri are two far from home settlement and more often they are used for extensive rearing and extensive cultivation of cereals. A greater part of customary land in this subdivision is still under employed. Due to the nature of roads and high transport cost it is very difficult for market gardeners to establish on these lands.

#### 3.5.2. Land Area and Usage

It was difficult to assess the total area of land owned by market gardeners as many did not know the size of the land themselves, partially because it had not been surveyed. This was particularly the case for Customary and inherited Land. Some gardeners claimed they had “more than 30 hectares of land” but couldn’t specify the exact amount. This was particularly the case of 3 market gardeners in Vekovi. Therefore only land use for market gardening activities was estimated. This information was grouped and analyse as shown on the table 6 below.

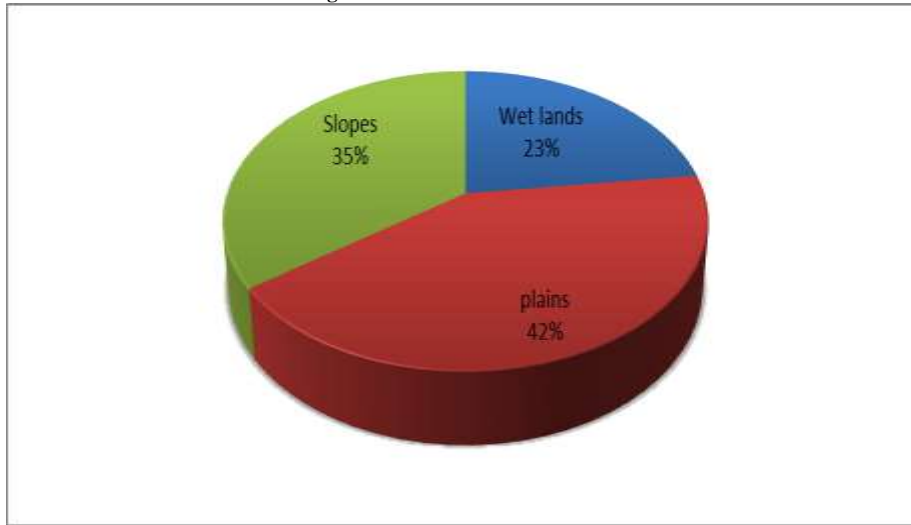
Table-6. Land use area

Land use in hectares	Frequency	Percentage
less than one hectare	23	23
1-2	41	41
3-4	28	28
4-5	8	8
Total	100	100

The highest market gardener had 5 hectares of land and use 3hectares only for the cultivation of tomatoes and the rest the cultivation of other crops. Those who had less than one hectare were mostly women and cultivated mostly huckleberry and cabbage mainly for consumption and only surplus is carried to the market. More than 60% of the gardeners in Jakiri subdivision still operate on land less than three hectares.

After describing the amount land used for market gardening, gardeners were asked to describe their main area of cultivation. Out of the 100 interviewed, 35 of them cultivate on slopes as their main area of cultivation, 45 on plains and 25 on wet lands. See figure 12 below

Figure-12. Main areas of cultivation



The population of Jakiri that was estimated at 75,000 with an annual growth rate of 2.9% and the population density stands at 111.11inhabitants/km<sup>2</sup> in 2006 [23]. This high growth rate of the population of Jakiri subdivision led to changes in the agricultural pattern. This increase in population brings about an increase in developmental projects like; the construction of schools, hospitals, roads, personal buildings and even churches. Thus occupying the low lands that could be used for agricultural purposes. As result many farmers in Jakiri are moving towards the hills in search for agricultural land.

Figure-13. Main areas of production



### 3.5.3. Methods of Irrigation and Sources of Water

The level of irrigation in Jakiri subdivision is still low but encouraging out 100 market gardeners interviewed only 56 Of them irrigate their farms and 44 do not irrigate. Also they do not uses modern means of irrigation out of the 56 that irrigate their farms only 14 of them uses motor pumps (table 7). More than 70% of them admit they are face with water shortages during the dry seasons which sometimes lead to low harvest and when it comes to the worst crops even dry up. That's why many of them more than 70% usually have the greatest harvest during the rainy season.

**Table-7.** Methods of irrigation used in farming in Jakiri

Method	Frequency	Percentage
Using motor pumps	14	25
Watering cans	18	32.1
Canals	11	19.6
Sprinkling	11	19.6
Using buckets	2	3.6
Total	56	100
Missing systems	44	
TOTAL	100	

Untreated water sources like streams, wells, rivers and springs are the main water sources for gardeners in Jakiri out of the 56 market gardeners that irrigate their farms nobody uses pipe born water, 14.3% uses water from rivers,44.6% uses streams, 25% uses shallow wells and standing water and 16.1% uses springs (table 8). Watering by water cans is the main mode of watering (32.1%) and the polluted water is directly in contact with the vegetables of which some are eaten raw, and is very dangerous to farmers who handle without any precautions and to the vegetable consumers after harvest. The gardeners do not have any idea on the quality and the risks of using this polluted water. They have acquired farming experiences from their parents, neighbours and other relatives. They are not train on any risk of polluting or using polluted water Delicate farm inputs like the pesticides, fertilizers and as well as the polluted water are used without precaution on protection. They use and through empty cans carelessly around their farms without thinking about the dangers they have on the environment.

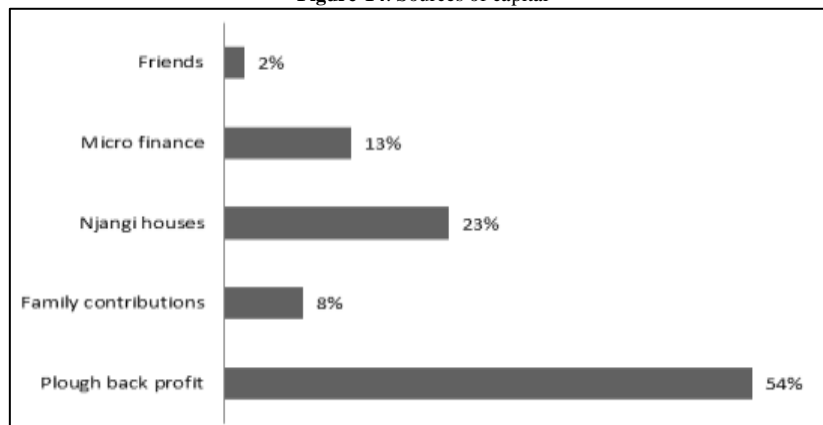
**Table-8.** Sources of water use for irrigation

Source	Frequency	Percentage
Rivers	8	8
Streams	25	25
Wells	7	7
Spring	9	9
Standing water	7	7
Total	56	56
Missing systems	44	44
Total	100	100

### 3.5.4. Sources of Capital

Helping market gardeners to invest in their own production for example, purchasing good seed of higher value vegetables, or a motor pump, or fencing to protect crops from theft and animals would help market gardeners improve their productivity, their contribution to the urban and rural food supply and their own incomes. Market gardeners in Jakiri subdivision acquire their capital from diverse sources such as; plough back profit, “njangi” houses, personal savings and credit unions. As seen on the figure 14 below.

**Figure-14.** Sources of capital

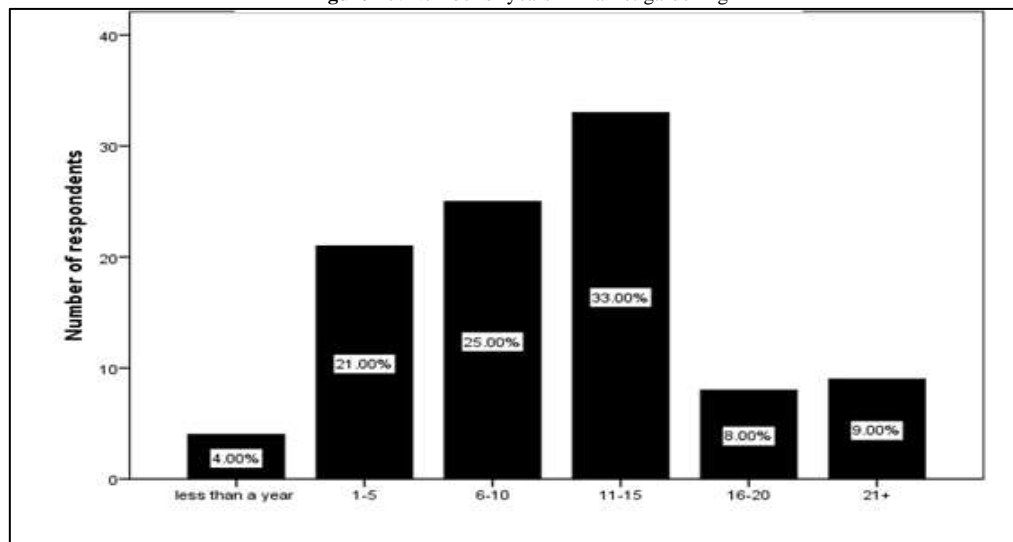


In figure 14 it can be observed that out of the 100 gardeners interviewed 54% obtain their capital from plough back profit and represent the highest source of capital in Jakiri subdivision and capital from friends represent only 2% that's only two persons obtained their capital from friends. Farmers in Jakiri complained of high interest rate given by financial institution couple with long procedures and lack of collateral securities. And that's why more than 80% of them prefer to go to get their capital from informal sources.

### 3.5.5. Number of Years in Market Gardening

Market gardeners were asked to specify the number of years they have been in market gardening. The essence was to know how long market gardening has been one of the major farming activities in Jakiri subdivision. 100 market gardeners were interviewed and the result grouped and analysed as seen in figure 15 below

Figure-15. Number of years in market gardening



The results prove that market gardening is a relative young activity in Jakiri which must be encouraged. As seen above the majority 33% of those interviewed have just been practicing market gardening from 11 to 15 years. The highest person has been in market gardening for 25years. The populations in Jakiri of recent are realizing the importance of market gardening. This is because market gardening in this area has never experience any encouragement from government, NGOs or even individuals. Two gardeners told us that some government officials have ones collected money from them promising to come and teach them new methods of production but vanished into thin air without stress. Thus they feel discouraged receiving any directives or researchers because they do not know who is who. These types of situations are what discouraged so many people from getting into this activity earlier.

### 3.5.6. Relationship Between Socio Economic Characteristics and the State of Market Gardening

The relationship between socio economic characteristics and the state of market gardening is presented on table 9 below.

Table-9. The distribution of socio-economic characteristics and the state of market gardening

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.489	.648		2.298	.024
Sex	.133	.186	.069	.715	.477
Family status	-.213	.094	-.245	-2.257	.026
Age	.209	.101	.228	2.071	.041
Number of children per household	.030	.054	.053	.546	.587
Level of education	.088	.114	.076	.766	.446
Previous employment	-.005	.040	-.012	-.121	.904

Dependent Variable: Reasons for engaging in market gardening

The relationship between the state of market gardening and the socio-economic characteristics of market gardeners in Jakiri sub-division was tested using the regression method. The result of their correlation(r) coefficient was 0.409 with a significant level (p) of 0.08. This indicates that the state of market gardening depend only about 16.8% on the socio-economic characteristics of gardeners in the Jakiri municipality. From table 16 above it can be observed that only three out of seven socio-economic characteristics are significant at the significance level 5%.

Thus there is a weak relationship between socio-economic characteristics and the state of market gardening in Jakiri. Therefore, anybody in Jakiri married or single, educated or uneducated can be involved in this activity. Hence we accept the hypothesis that the socio-economic characteristics of market gardeners do not have a significant influence on the state market gardening in this located.

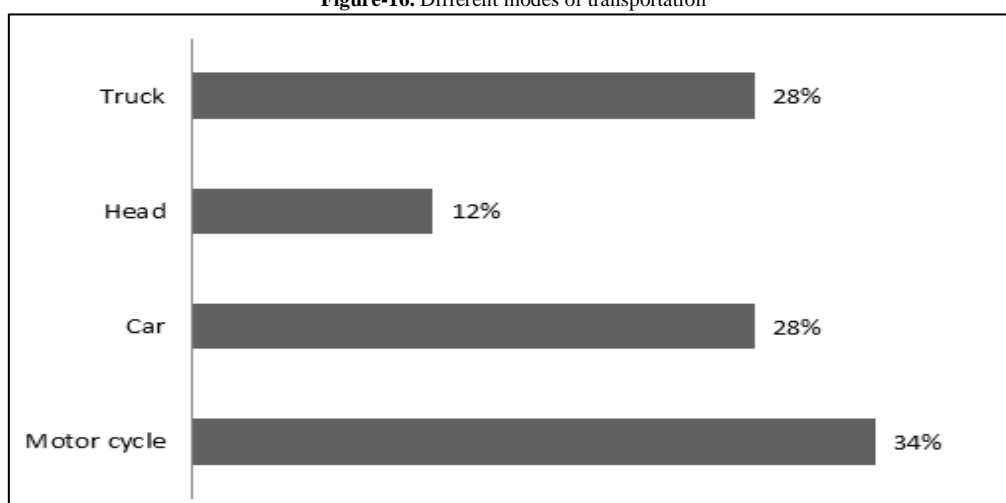
### 3.5.7. Marketing of Market Gardening Crops in Jakiri Sub-Division

Marketing is a function of marketing strategies and channels adapted to distributed and sell products. Farmers need to develop a clearly focused marketing plan before any crops are planted [25]. Thus due to high perishability of market crops, lack of storage facilities and no transformation industry market gardeners in Jakiri subdivision during harvesting time, most find buyers to buy their crops within the shortest time possible. Almost all their produce is sold fresh. Thus gardeners' incomes depend on the length of the marketing chain. The closeness and the accessibility from Jakiri centre to other towns (Kumbo, Ndop and Bamenda) is a double advantage for market gardeners in this area to transport their crops to these areas for sale.

### 3.5.8. Transportation of Market Crops to Various Sale Points

Market gardeners in Jakiri subdivision are responsible for delivering their produce to the point of sale. They are responsible for transportation charges and for choosing the transportation means they will want to use. The different mode of transportation used by gardeners in Jakiri subdivision is shown on the [figure 16](#) below

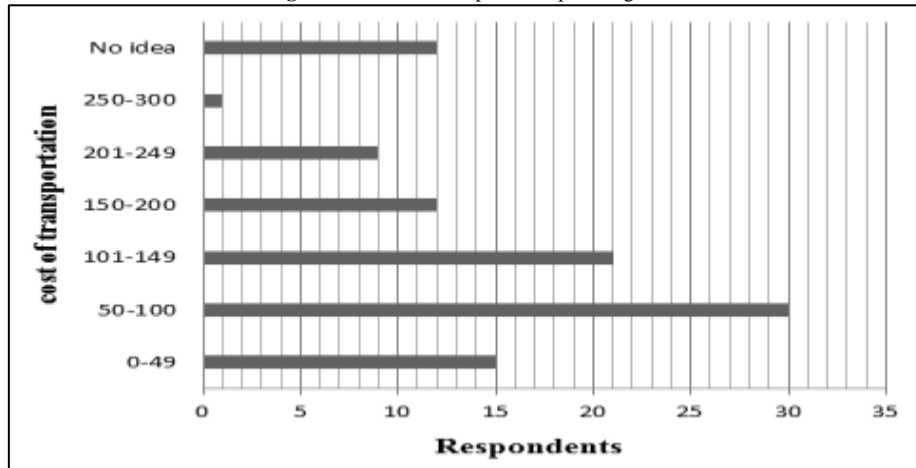
Figure-16. Different modes of transportation



One of the highest drawbacks of market gardening in Jakiri subdivision is the means of transportation. Out of the 100 respondents 34% of them use motor cycles as a major means of transportation for their crops to the market. This is as results of the bad stage of farm to market road. They are very muddy during the dry season and dusty during the rainy season. Most gardeners using the head (12%) as a major means of transportation are mostly those who sell directly to households in the village markets or squares and cultivate these crops beside their houses. 28% of those who are using trucks as a transportation means are mostly those who sell outside Jakiri subdivision particularly in Douala and Yaounde. Those who sell in Kumbo and Jakiri main market use cars as a major means of transportation.

More than 80% of market gardeners in Jakiri subdivision complained of high transportation cost which comes as a result of bad roads and increases in the price of petrol. A farmer told us that the cost of a bag of Irish potatoes from Vekovi to Douala cost 2500 FRS and another one said for a basket of tomatoes to leave Nkar to Kumbo cost 300FRA though the road is tarred and that when the road was not tarred it cost 250FRS which is in line with the increase in petrol prices. On discussion with one of the wholesalers he told us that, the cost of transporting a bag potato from Vekovi to Douala is 3000FRS. The [figure 17](#) below shows transportation per kilogram paid by different gardeners in Jakiri subdivision.

Figure-17. Cost of transportation per kilogram

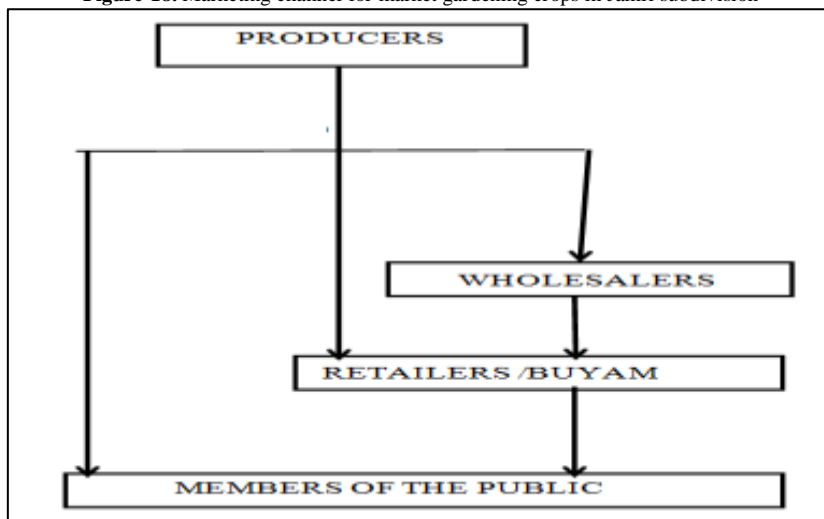


The cost of transportation varies from one market gardener to another depending on the distance, mode of transportation and the nature of the roads. Some market gardeners could not estimate their cost of transportation per kilogram. The gardeners equally explain that the cost of transportation is higher in rainy than during the dry season. This is because during the wet season some roads leading to areas of production becomes too muddy and sometimes becomes impassable for cars and bikes. During this period transport cost become too expensive and producers prefer to sell a greater part of their produce in the farm. 30% of the farmers in Jakiri pay between 50 and 100FRS per kilogram for their produce to arrive the market. Thus this explains why vegetable produce are sometimes expensive in the market at the peak of the rainy season when there are no shortages. These crops are sold differently at different destinations.

### 3.5.9. Market Chain

The performance or efficiency of a market chain is as a result of how well the actors in the chain are organized and also how well the chain is supported by a range of services that are also described as ‘business development services’ [26]. These services include transportation, research, supply and marketing. Market gardening is relative a young activity in Jakiri as compared to other places like Santa, Foubot, Kombou etc. Thus their market chain is not yet well developed and cannot be compared to the market chain in these places. Most market gardeners in Jakiri depend on intermediaries to market their products. Sales are arrange by producers individually rarely do deal with buyers collectively. This makes market gardeners in Jakiri not to be able to control the market. The market chain in Jakiri is shown on the [figure 18](#) below

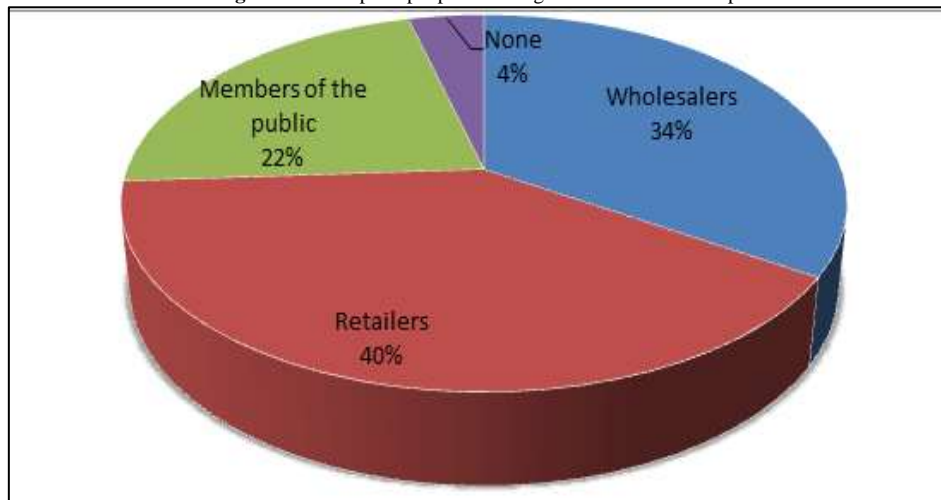
Figure-18. Marketing channel for market gardening crops in Jakiri subdivision



In [figure 12](#) above show the relationship between production and marketing of market gardening crops in Jakiri subdivision. The producers have a direct or an indirect relationship with the customers depending on the kind of arrangement. Wholesalers buy these products and transport them to other urban centres. Retailers are found everywhere in Jakiri subdivision and in urban centres. Wholesalers who buy these crops in bulk transport it to towns and resale them to retailers that in turn sale them to consumers in these towns. The [figure 19](#) below shows groups of people market gardeners sell their crops to in Jakiri.



Figure-19. Groups of people market gardeners sell their crops



Members of the public (households, restaurants, schools etc), “buyam sellams” and whole sellers are the people market gardeners in Jakiri sell their produce to. Out of the 100 interviewed 22 of them sells a greater part of their products to members of the public. The most striking findings was the number of people that sells their products to retailers that is 40% and that some producers do not even sell their products that is 4%. This means that more than 80% of products produce in Jakiri goes to the market. More than 34% of the market gardeners sell all that is produced Members of the public (Households, restaurants and schools) are the end purchasers of the produce and it is usually purchased for household consumption. Enquiries made at 3 restaurants and one boarding school around Jakiri revealed small to medium sized restaurants and boarding schools also purchased their produce from various village markets and sometimes buys directly from producers. Small size restaurant operators received no special treatment from market sellers and were not distinguishable from other customers in the market.

More than 70% of market gardeners always have customers though sometimes experience price fluctuations especially in external markets due to competition with other advanced market gardeners from other places especially those coming from the west region. Retailers are composed mostly of women. They buy in smaller quantities or average quantities directly from the producer at farms gates or local markets and carried them to towns and villages. In towns, the products are re-sale in smaller bunches to urban consumers. Some of these retailers buy also in the urban markets from the producers, directly who have made their way to urban markets. After buying they sell it immediately in the same market or carry it to neighbouring village and urban markets. Crops for commercialisation are measured in different measurement units. The table 10, below shows the crops types, their measuring units, quantity contain the lowest and the highest prices for these products. From the field we learned that the variation in the prices of these products varies depending on the forces of demand and supply.

- When there are many producers supplying at a particular time prices will fall drastically because during this period they are price takers. On the other hand when there are few suppliers there will be scarcity and hence consumers will be price takers and an increase in price.
- Availability of demand; whether during periods of high or low production it depends on the consumers demand. High demand will also push the prices to increase. This demand is greater from urban consumers. Many market openings or opportunities will implies high demand and prices will also augment.
- Foreign markets; when the borders of countries like Gabon, Equatorial Guinea and Congo are opened prices will rise. This is because the other producers from other towns will export their products and those from Jakiri will witness less competition the internal markets.

Thus market gardening crops are faced with too much price fluctuations. Nonetheless it still remains one of the more profitable activities of farming. Farmers in Jakiri use different units to measure their crops before sale. (Table 10)

Table-10. Distribution of sample crops, their measurement units and their prices

Crop	Unit of measurement	Lowest price/unit	Highest price/unit	Average
Tomatoes	25kg Basket	2000FRS	8000FRS	3500FRS
Carrots	50kg Bag	4000FRS	7500FRS	5300FRS
Huckleberry	50kg Bag	2000FRS	10000FRS	3200FRS
White cabbage	50kg Bag	1500FRS	5000FRS	1980FRS
Red cabbage	50kg Bag	1300FRS	4000FRS	2000FRS
Onions	Tin (20litters bucket)	3500FRS	12000FRS	5000FRS
Irish potatoes	100kg Bag	15000FRS	30000FRS	20000FRS
Leeks	5kg Buddle	200FRS	500FRS	352FRS

In Jakiri subdivision, vegetables are taken to the market on daily bases by different farmers with an average of 2 days per week. Vegetables are usually harvested in the evening and in the early hours of the day especially on market days so as to carry it to the market as early as possible. Market gardeners estimated between 70% and 80% of

all vegetables produced are sold for income generation while the remaining produce is consumed by the household. Families had a tendency to eat what could not be sold, for example second grade vegetables and produce not sold at the end of day.

Finally respondents were asked whether they have a steady market for their products. Their responses are shown on the [table 11](#) below

**Table-11.** The distribution of gardeners according to the market availability

Response	Frequency	Cumulative Frequency
Yes	74	74
No	23	97
Uncertain	3	100

As seen from the statistics in the [table 15](#) above 74% of the of the gardeners in Jakiri sub division do not face difficulties as far as marketing their products is concern. This is as a result of population bomb and an increase in the demand for food. The greater number of them complained of price fluctuations though admitting that prices are increasing year in year out but are never stable. There were only three gardeners who were indifferent and did not know whether there is available market or not.

### 3.6. The Role of Market Gardening in the Improvements of Livelihoods in Jakiri Subdivision

Market gardening affects livelihoods in Jakiri primarily through quality and quantity food provision, income generation and employment. Questioning respondents on their livelihood history, many had made the transition from subsistence cereal farming to market gardening. To them market gardening crops are cash crops and provide a steady income. To understand how the transition to market gardening was made, it was important to establish the role of market gardening in livelihood strategies, followed by an examination of the relationship between market gardening, cereal cultivation, cash crop cultivation and other income generating activities in Jakiri subdivision. 100 questionnaires were shared and the result was grouped and analysed in the following headings below.

#### 3.6.1. Reasons for Engaging in Market Gardening

Market gardeners had diverse reasons for engaging in market gardening. These reasons include; diversifying their sources of income, increasing their living standards, source of employment etc. For us to obtain this information market gardeners were asked the reasons for undertaking market gardening activities and their motivations was gathered and presented in [table 12](#) below.

**Table-12.** The distribution of showing reasons for undertaking market gardening activities

Reasons	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Profitable nature	33	33.0	33.0	33.0
Improve my standard of living	8	8.0	8.0	41.0
Have nothing else doing	17	17.0	17.0	58.0
Diversified my sources of food	10	10.0	10.0	68.0
Diversified my income	19	19.0	19.0	87.0
Prefers self-employment	9	9.0	9.0	96.0
Others	4.0	4.0	4.0	100.0
Total	100	100.0	100.0	

A high number of respondents undertook market gardening activities because money was required to support their household and daily living expenses (Food, Electricity and Health). That is the reason why number of them, that is 33 in number undertook market gardening because of its profitable nature and 19 of them undertook this activity in order to diversify their sources of income. Often there were other members of the family who were unable to work (the elderly, children and sick members of the family) and support for their basic needs was required. Many market gardeners stressed the importance of saving money for their children's education. In these instances, the money generated from market gardening activities was not intended for personal use.

The most striking finding was the number of people who undertook market gardening because they have nothing else doing. This category of people were mostly youths who have just completed high school and did not have enough finances to continue their education and could not find any other job in a town or the village. Also 9 market gardeners prefer self-employment. Their reasons were that since they are not educated they prefer to stay in the village rather than moving to towns and doing odd jobs (digging toilets, house helps, pick pocketing etc) and living in slumps. This confirms the role of market gardening as a source of employment and a reduction in rural urban migration.

Interestingly, 10 gardeners engaged in market gardening activities as a source to improve on the quantity and quality of food. In this case only surpluses were carried to the market and very little income made. One of them told us that although she is involved in market gardening she still buys some market gardening crops to be able to make up with food demands for her household. Thus in this case market gardening plays the role of hunger reduction and an

increase in the consumption of nutritive food even by those who are considered poor in the society. Other reasons some people engaged in market gardening include; hobby, imitating their friends and making use of the small free land beside their houses.

### 3.6.2. Average Hours Spent in Market Gardening Activities per Year

The total hours spent on market gardening activities varied from person to person depending on their farm sizes, distance from their residence, capital and household situation. Table 13 below presents the average hours spent per year by market gardeners, their children, family members, hired labour and others in their farms.

**Table-13.** The distribution of average hours per year spent on market gardening activities

Labour supply	Average hours
Market gardeners	1639.3
Family members	612.4
Children	213.1
Hired	1019.3
Friends	144.9
Total	3629

The highest market gardener spent 2600hours in the farm per year while the lowest spent 416hours that is an average of 8hours per week. The table above shows that averagely market gardeners spent more time in their farms. This is because market gardening requires too much attention and care and nobody can better do that apart from the market gardener himself. The high amount of hours spent by hired labour indicates that market gardening is increasing in Jakiri and gardeners are no longer practicing market gardening only for consumption but more for income. It equally proves that market gardening is a source of employment. Thus even those who do not own gardens can equally benefits from market gardening in Jakiri subdivision. These workers receive wages ranging from 1000FCFA and 5000FCFA per day. This proves market gardening as a source of income even to non-gardeners. The present of friends indicate the existence of community life in this area.

Children spent the lowest number of hours' in the farm per year. This is because they go to school from Monday to Friday and can only assist in the farm on Saturdays. Some farmers have children in boarding schools and institutions of higher learning. These categories of children assist in the farm only during holidays. Some of them do not go the farm at all. This is because during holidays they move to other bigger towns to visit their relatives. Thus market gardening activities are left in the hands of their parents and younger ones.

Men are more involve in clearing and tilling farms while women and children always assisted during weeding, harvesting, marketing and other light activities in the farm. This shows the existence of division of labour in the study area. Figure 20 below shows the division of labour in a tomato farm.

**Figure-20.** Family division of labour in a tomato farm during harvesting



Work such as sowing, weeding and harvesting are done together, although there is a tendency for males to be responsible for ploughing, fertilising, spraying and fence making. It is very rarely to see men assisting with the vegetable selling. Males viewed market selling as “women’s work” and prefer to tend to the gardens while the women sold their produce in the various village markets.

### 3.6.3. Income and Expenditure

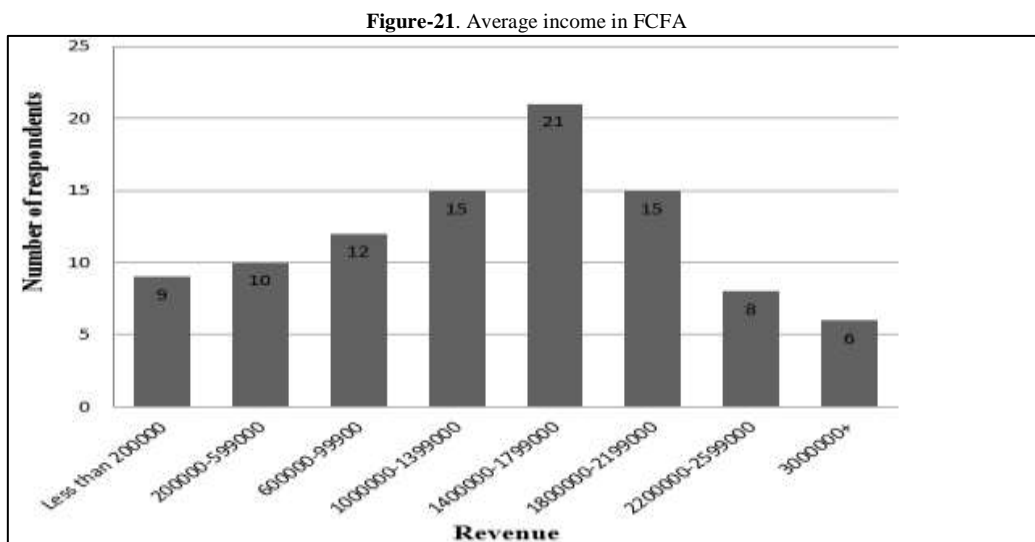
Assessing the income and expenditure of market gardening was extremely difficult as no written records on production or sales were kept. Market gardeners were therefore asked to estimate their yearly income and discuss the importance of market gardening in their livelihoods improvement.

### 3.6.4. Income

The questionnaires that were distributed to 100 gardeners sought to determine their primary and any secondary sources of individual income, sources of household income, expenditure, and the significance of market gardening revenue in comparison to other sources of income. This information would determine the monetary role of market gardening in the overall poverty reduction.

### 3.6.5. Average Income Generated from Market Gardening

Calculating the income generated from market gardening was extremely difficult because market gardening is an informal sector of employment in Jakiri subdivision. In addition to no sales records, respondents often spent money as they earned it in a ‘hand to mouth’ fashion. However, in order to obtain an overall indication of income generated, respondents estimated the amount of money they earned per year from market gardening. The spread of average income generated by market gardeners is presented in the figure 21 below.



It should be noted that out of the 100 respondent 2 consume everything they produced hence their level of income from market gardening is not included in the figure above. Also it was the first time of the other two respondents in market gardening and they could not estimate their level of income from this activity since it was their first year. The highest earned 4500000FCFA while the lowest earn 21000FCFA. Most of those who earn below 200000FCFA were mostly housewives and produce mainly for household consumption and only surpluses were carried to the market. From the figure above it can be observed that market gardening is a lucrative activity in Jakiri and needs only little encouragement from the various stakeholders. Most gardeners earn averagely from 1400000 and 1799000 with an averagely monthly earnings of 133292FCFA.

### 3.6.6. Sources of Market Gardeners Income

Including market gardening activities, households had between 1 to 6 different sources of income. Very few market gardeners had only market gardening as their only source of income. The variety of the different sources of households’ income indicates the diversification of households in come in Jakiri subdivision. The table 14 below illustrates the main sources of households’ income.

**Table-14.** The distribution of main sources of household income

Activity	Number of respondents		
	First source of income	Second source of income	Third source of income
Market gardening	61	14	11
Cereals	21	34	15
Cash crops	4	12	7
Palm wine	4	7	8
Business	3	17	30
Rearing	2	6	8
Others	5	10	17

Market gardening was the main source of income to a majority of market gardeners. 61 of them had market gardening as their major source of income. Most of them 34 in number cultivated cereals as their second source of income. This proves that cereals farmers in Jakiri are gradually realising the importance of market gardening in income generation. Cash crop (coffee) which was the major source of households’ income in Jakiri in the late 80s and early 90s have totally lost its position only 4 gardeners had cash crops as their major source of income. Petit

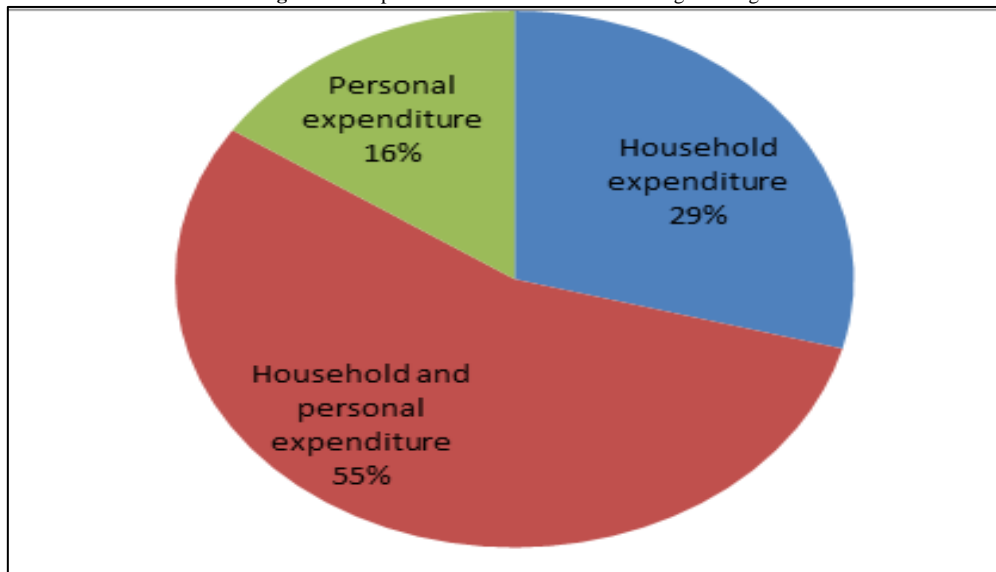
businesses in villages where market gardening is practice is on the rise and that account while there are so many market gardeners who have taken business as the secondary source of income

In general, the secondary sources of income were small in scale, consumed less time, generated less revenue than market gardening and were often seasonal in nature with the exception of business. For example beans and maize are cultivated ones a year. Nevertheless, some farmers have adopted new species and farming methods that permit them to cultivate cereals twice a year. Similarly, coffee is harvested once a year and sold during coffee season at any price prevailing in the market. Family members working in the government and other lucrative jobs in towns usually sent remittance back home. Thus this constitutes one of the major sources of household income in Jakiri subdivision. The dominance of market gardening over other income generating activities as a major source of income prove the fact that market can be used as a means to fight against poverty in Jakiri subdivision.

### 3.6.7. Expenditure

Revenue generated from the sales of market gardening crops was either used for personal spending by the respondent, household spending, and combinations of the two. This research work considered those who consumed everything produce as household expenditure. Figure 22 below illustrates how the 100 respondents spent the revenue generated from the sales of market gardening crops.

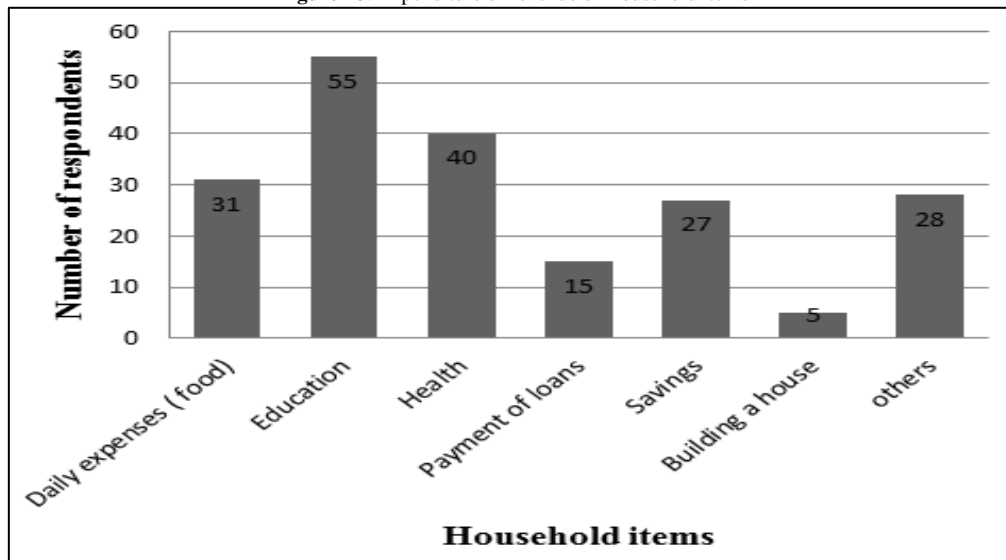
Figure-22. Expenditure of revenue from market gardening



Only 15 out of 100 gardeners interviewed (28%) spent all the revenue they get from the sales of market gardening crops on personal expenditure only. These gardeners who spent all their revenue on personal expenditure were all single. The majority of market gardeners (55%) pooled their revenue from marketing gardening into the household and personal expenditure basket. And 29% pooled all their revenue to household expenditure only.

The main household items market gardeners spent their revenue on them include; children education, health, payment on loans, food and so many others as shown in the figure 23 below. It should be noted that a majority of market gardeners spent their revenue on more than one household item and were counted more than ones.

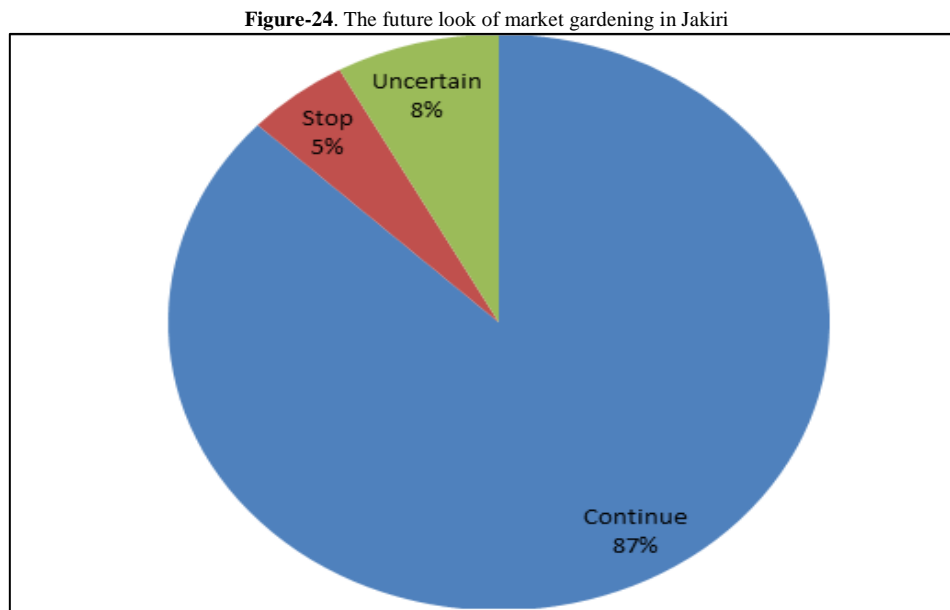
Figure-23. Expenditure of revenue on household items



For most households (55), revenue from market gardening was spent more on education for children, followed by health 40. Some market gardeners 5 in number used part of the income from market gardening in the construction of their personal homes. Some of them save part of their revenue especially in “njangi” houses and in credit unions for their children school fees and unforeseen. Other activities market gardeners used their revenue for include; rendering help to other family members and friends, weddings, death celebrations, gifts and some of them even give loans to some of their friends and neighbours when they are in need. All the above explanation shows how market gardening has increase the living standards of market gardeners and non-gardeners in Jakiri subdivision.

### 3.6.8. The Future of Market Gardening in Jakiri Subdivision

The selected market gardeners were further asked to consider their future as market gardeners. They gave responses such as uncertain to continue the activity and stop the activity. These responses were grouped and presented in the [figure 24](#) below.



Out the 100 gardeners interviewed 87 of them said they will continue as market gardeners. Most of them acknowledged the fact that since they started this activity they have realised an increase in their income and a changed in their standard of living. On discussion with one of them he told us that he can boost of a house with 7 rooms, two children in the university, 1 in a boarding school all thanks to this activity and that he will remain a gardener till his last day on earth. Those who were uncertain 5% constituted two women and three young men. Those who think (8%) they were going to stop this activity were the old and the young. Some young people think they are going to stop and continue with their education while some under look the activity and think they will move to towns and operate new businesses. [Table 15](#) below explain the reasons market why some gardeners prefer to continue in this activity. Some gardeners advanced more than one reason and as a consequent were counted more than ones.

**Table-15.** Reasons for continuing as a market gardener

Reasons	Frequency
Market gardening is more profitable than other farming activities	47
A source of employment	11
Need money for my household	43
Too old and cannot find any other job	9
Interested in expanding market gardening into commercially bigger Projects	32
Market gardening provided an easy, enjoyable lifestyle.	22
Others	17

In general market gardeners in Jakiri subdivision wants to continue as gardeners simply because it provide a steady source of income and it is more profitable. In fact many respondents were passionate about market gardening.

### 3.7. Indicators of Poverty Reduction

The indicators of poverty reduction are presented on [table 16](#) below.

**Table-16.** The correlation between indicators of poverty reduction

		Increase in standards of living	Increase in income	Revenue from market gardening	Number of years in market gardening	Part of revenue spent per year
Increase in standard of living	Spearman's correlation(r) Sig.(2tailed) N	1 100	-.014 100	.608* 100	.273** 100	.069 100
Increase in income	Spearman's correlation(r) Sig.(2tailed) N	-.041 100	1 100	.198* 100	-.179 100	-.178 100
Revenue from market gardening	Spearman's correlation Sig.(2tailed) N	.608* 100	.198* 100	1 100	.309** 100	.221* 100
Number of years in market gardening	Spearman's correlation Sig.(2tailed) N	.273** 100	-.179 100	.309* 100	1 100	.230* 100
Spending on household items per year	Spearman's correlation Sig.(2tailed) N	-.178 100	.212* 100	.213* 100	.230* 100	1 100

\*\*Correlation is significant at 0.01level (2-tailed)

\*Correlation is significant at 0.05level (2-tailed)

N= the sample size and p= level of significance

The Spearman's correlation was carried out to look at the relationship between the increase in living standards, income from market gardening, increase in income, the experience in market gardening and the spending on households' items. The results obtained shows significant evidence between increase in living standards and revenue from market gardening ( $r=0.608$  and  $p=0.042$ ), increase in living standards and the number of years spent as a market gardener ( $r=0.273$  and  $p=0.006$ ), increase in income and the revenue from market gardening ( $r=-0.198$  and  $p=0.048$ ), number of years spent as a market gardener and increase in revenue ( $r=0.308$  and  $p=0.002$ ), households spending and revenue ( $r=0.221$  and  $p=0.034$ ) and the number of years spent as a gardener and spending on households' items ( $r=0.230$  and  $p=0.021$ ). This analysis shows that there was a strong relationship between the experience as a market gardener and all other indicators of poverty reduction like; increase in income, spending and living standards. Hence we reject the hypothesis that market gardening have not contributed significantly to poverty alleviation in Jakiri subdivision.

### 3.8. Problems Adaptations and Suggestions

#### 3.8.1. Problems and Adaptation

**Figure-25.** Common perishability and disease attack on horticultural practices

In as much as market gardening can be used as a tool to fight against poverty in rural milieu and Jakiri in particular nonetheless this activity still faces some challenges. Thus to better obtain a broader understanding of the relationship between market gardening and poverty reduction, respondents were asked to comment on any concerns or problems associated with market gardening activities, their effects on them and to the population in general and their level of dealing with the problems, that is the adaptation methods. These problems, their effects and adaptations are summarised in table 17 below.

**Table-17.** The distribution of problems, effects and adaptation technics

Problems	Frequency	Effects	Adaptation methods
Climate variability	85	Pest and disease prevalence e.g. blight Uncertainty in planting periods Droughts	Use of insecticides, herbicides, fungicides and pesticides Increased irrigation
Loss in soil fertility	67	Low crop yields Attack of pests and diseases	Increase use of organic and inorganic manure
Poor farm to market roads	77	High cost of transportation Post-harvest losses Exploitation by middle men	High use of motor cycles and transportation of crops on heads
Lack of storage facilities/Processing industries	49	After harvest losses Low cost of produce because of no value added	Drying of some products e.g. cabbage and huckleberry Store some produce on cold and dry cemented floor e.g. tomatoes Store some produce on cold dusty floor e.g. potatoes Farm gates
Insufficient markets	74	Price fluctuations Increase competition when carried to other markets out of Jakiri	External market
Insufficient extension workers and lack of government support	81	Poor application of chemicals Low quality seeds Ignorant of farmers and no book keeping	Seek advice from other experience farmers in and out of Jakiri subdivision
Farmer-grazer conflicts	28	Small farm sizes Extortion of farmers by law officials Increase in cost of production as farmers have to construct fences round their farms.	Building up mutual relationship with Fulani's and Bororos and other rarer Fence construction round the gardens
Insufficient sources of water	58	Low irrigation	Construction of water canals
Access to capital	88	Small farm sizes Low application of chemicals	Reinvestment of plough back profit Borrowing from Njangi houses

Most of the farmers advanced more than one problem that explains the irregularity in the table above. Access to capital, climate variability, insufficient extension workers and government support and poor farm to market roads were the biggest worries of market gardeners in Jakiri subdivision. From the above analysis (table 18) it can be seen that market gardening in Jakiri subdivision still faces a lot problems and need rapid intervention from the government and men of good will. Nevertheless, this does not in any way reject the hypothesis. Despite all of these problems faced market gardeners in one way or the other try to find a solution to their problem in order to stay in business. This proves the profitability and the importance of market gardening to market gardeners and in general to the people of this subdivision. Thus market gardening is still a growing activity in this subdivision and can be used to fight against poverty.

### 3.8.2. Suggestions

These suggestions were grouped and summarised on the table 18 below.



**Table-18.** Market gardeners suggestions for the improvement of market gardening in Jakiri subdivision

Number	Suggestions	Frequency
1	Provide gardeners with improved seeds	78
2	Subsidies farm inputs	87
3	Regular training and visits by extension agents	82
4	Improve on the nature of farm to market roads	85
5	Provide storage facilities and processing to add value	55
6	Encouraged NGOs to invest in this activity	30
7	Provide capital by reducing interest rates	76
8	Build reservoirs and dams for irrigation	58
9	Help farmers to form CIGs	12
10	Reduce corruption and make land more accessibility	38

As can be seen in the table 17 above a good number of gardeners advanced many suggestions that if adopted can improve on the level of market gardening in Jakiri subdivision. Most of these suggestions are tilting towards the increase in government expenditure and investment. More than 94% thinks increasing the productivity of these crops will go a long way to improve their livelihood in particular and that of the population of Jakiri in general.

## 4. Conclusion

Market gardening in Jakiri subdivision operates on a small scale. Operators lack proper knowledge about chemicals for pest and disease control and encountered a number of problems such as lack of capital, difficulty in securing land space for expansion and no extension services. Nonetheless, it is a lucrative venture and therefore a veritable source of livelihood for the operators. Young people, especially those in the job market and retired people could be encouraged to take up full-time market gardening as a profession by providing funds, land and ensured market of produce. There is need for extension education on the use of chemical for pest and disease control through seminars, demonstrations and regular visits.

The probability that a gardener in Jakiri subdivision can sell his crops is 0.74 implying that the market for selling these crops is available in jakiri subdivision. Nonetheless this high level of market availability in this Subdivision may be affected by other factors like the bad nature of farm to market road. Market gardening is a very promising activity in Jakiri when we consider the amount of crops that goes to the market for sale, that is 80% and the ready market.

This research reveals that market gardening plays an important role in the fight against poverty in rural areas. Evidence of the role of market gardening in poverty reduction is the adoption of market gardening in Jakiri subdivision primarily for employment, financially support for the household, health and children's education. Only a few market gardeners had mixed feelings about their choice of farming activity. Approximately 70% of the total households' income comes from market gardening. Thus more than 60% of these households have market gardening as their main source of income. Hence, there is a correlation between market gardening and the contribution to total household income in Jakiri subdivision

The relationship between improvements in living standards of the market gardeners and market gardening is a clear indication that farmers in Jakiri subdivision are gradually realising the importance of market gardening in income generation. A good number of them have adopted market gardening as the main source of their households' income. More 70% of gardeners earned approximately 83334FCFA per month. Comparing this earnings to the base salary of about 30000FCFA per month proposed by Cameroon government, prove the fact that market gardening if encouraged in rural areas can reduce rural urban migration, crime wave while reducing poverty at it very source.

## References

- [1] NEPAD, 2013. "Agriculture in African -transformation and outlook." Available: <http://www.nepad.org>
- [2] Thirtle, C., Lin, L., and Piesse, J., 2003. "The impact of research-led agricultural productivity growth on poverty reduction in Africa, Asia And Latin America." *Journal on World Development*, vol. 31, pp. 1959-1975.
- [3] Minader, 2012. "Annuaire des statistiques du secteur agricole campagnes 2009 et 2010." *Direction des Enquêtes et des Statistiques Agricoles AGRI-STAT*, p. 123. Available: [http://cameroon.countrystat.org/fileadmin/user\\_upload/countrystat\\_fenix/congo/docs/AGRISTAT%2017.pdf](http://cameroon.countrystat.org/fileadmin/user_upload/countrystat_fenix/congo/docs/AGRISTAT%2017.pdf)
- [4] Bucep, 2010. *Rapport final 3ème recensement général de la population et de l'habitat au cameroun, répartition de la population résidant dans la province du littoral par département et par arrondissement/district, Yaoundé, Cameroun*, pp. 45-47.
- [5] Fongang, G., 2012. "Les organisations de producteurs en afrique de l'ouest et du centre: Attentes fortes, dures réalités. Le cas du cameroun. Fondation pour l'agriculture et la ruralité dans le monde (farm) : Rapport pays." p. 86.
- [6] Minader, 2009. *Stratégie nationale de développement de la riziculture au Cameroun*. Yaoundé: Mouture III. p. 21.
- [7] Molua, E. L. and Lambi, C. M., 2006. "Climate, hydrology and water resources in Cameroon." In *CEEPA Discussion Papers, Special Series on Climate Change and Agriculture in Africa. Centre for Environmental Economics and Policy in Africa (CEEPA), University of Pretoria, South Africa*. pp. 1-37.

- [8] USAID, 2003. "Famine early warning systems (fews) in the sahel." Available: <http://www.fews.org>
- [9] Bimala, P., 2015. *Role of remittance in rural poverty reduction: A case study of budhabare vdc no.9.* Jhapan, Nepal.: The Noragric Department of Norwegian University of life Sciences: . p. 91.
- [10] Tazoacha, F., 2001. "The causes and impact of poverty on sustainable development in Africa." In *A paper presented at the conference held in Bordeaux, France. RPRC Working Paper No. 06-05.13.*
- [11] Friesen, L. G., 1998. "Toward a market economy: fruit and vegetable production by the peasants of New Russia, 1850-1900." *Canadian Slavonic Papers*, vol. 40, pp. 27-42.
- [12] Amawa, S. G., Ndzifon, J. K., Sunjo, T. E., and Azieh, E. A., 2015. "The implications of climate variability on market gardening in santa sub-division, north west region of cameroon." *Journal of Environment and Natural Resources Research* volume, vol. 5, pp. 14-23.
- [13] Temple, S. J., Temple, C. M., van Boxtel, A. J. B., and Clifford, M. N., 2001. "The effect of drying on black tea quality." *Journal of the Science of Food and Agriculture*, vol. 81, pp. 764-772.
- [14] IRAD, 2010. "Etat des lieux sur la production, la commercialisation et la consommation des fruits et légumes au Cameroun." In *La Cellule de Préparation de la Constitution de la Plate Forme Camerounaise pour la Promotion des Fruits et Légumes.*
- [15] IMF, 2010. "Cameroon: Poverty reduction strategy paper. Country report no. 10/258." p. 173. Available: <http://www.imf.org>
- [16] Gustavo, A. and Kostas, S., 2007. "Rural development and poverty reduction: is agriculture still the key?" *Electronic Journal of Agricultural and Development Economics*, vol. 4, pp. 5-46.
- [17] Minepat and Undp, 2009. "Cameroon millennium villages program (cmpv)." In *Evaluation of UNDP Contribution - Assessment of Development Results: Cameroon.*
- [18] FAO, 2012. "Growing greener cities in africa. First status report on urban and Peri-urban Horticulture in Africa." p. 116. Available: <http://www.fao.org>
- [19] Jakiri Council, 2006. "Monographic study jakiri." Available: <http://www.jakiricouncil.org>
- [20] FAO, 2016. "la situation mondiale de l'alimentation et de l'agriculture changement climatique, agriculture et sécurité alimentaire, Rome 2014." Available: <http://www.fao.org/3/a-i6030f.pdf>
- [21] Marniesse, S. and Peccoud, R., 2003. "Aides et coopération international. La revue de l." *Afrique et du développement VARIA*, pp. 267-268.
- [22] IFAD, 2016. *Fostering inclusive rural transformation.* Investing in Rural People, p. 379.
- [23] Jakiri Council, 2012. "Jakiri council development plan." Available: <http://www.jakiricouncil.org>
- [24] Kometa, S. S. and Yiven, B. L., 2017. "Post-harvest challenges of food crops in jakairi sub- division, cameroon. A threat to food security." *International Journal of Agriculture and Environmental Research*, vol. 3, pp. 2455-6939.
- [25] Bachmann, H., 2002. "Lively footbridges - a real challenge." In *Proceedings of the International Conference on the Design and Design and Dynamic Behaviour of Footbridge.* Paris, France. pp. 20-22.
- [26] Ferris, S., Kaganzi, E., Best, R., Ostertag, C., Lundy, M., and Wandschneider, T., 2006. "A market facilitator's guide to participatory agroenterprise development. International centre for tropical agriculture (ciat)." *Enabling Rural Innovations (ERI), Guide*, vol. 2, p. 141.