





# África em debate

Problemáticas do desenvolvimento  
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# A socio-economic and environmental analysis of peri-urban agricultural activities in the Yaounde-Nsimalen area

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## Introduction: urban agriculture in an increasing scale in developing countries

The relationship between the urban and rural environments and the implications originating from that link have created two terms that are being used to describe that relationship in the same region. They are peri-urban and urban agriculture, (Spricigo and Filippi, 2007). Urban agriculture According to the Food and Agriculture Organisation, 2007, is increasing in towns in developed countries as well as in developing countries. According to Ndi, 2009, urban and peri-urban agriculture is not new in the cities of Sub Saharan Africa, it has increased in scale and intensity during the past years and is receiving more attention form town planners. There is an increase in the number of urban areas formulating policies and action plans for urban agriculture in the developing countries. Some towns have even included urban agriculture in their town plans. Boucher, 2009 analyzed the concept of agricultural urbanism as an idea in urban planning and design wherein agriculture is integrated in urban growth. This concept seeks to create a link between food, territory and health. It creates an environment that accepts urban agriculture, farming areas, a place for local products and sensitization.

Peri-urban agriculture is the cultivation of crops in the periphery of an urban area. There is a slight modification in urban functions as one moves away from the heart of the town to the periphery. The cultivation of crops which cannot be done in the heart of the town is practiced at the periphery. This is simply because of the availability of land for crop cultivation in this part of urban area. More and more, urban dwellers as well as some rural dwellers are involved in the cultivation of crops in the peri-urban area to feed the urban population. It is widely accepted that peri-urban agriculture is

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an important livelihood or coping strategy amongst the poorest urban households for food security and income generation in developing countries (Thornton, 2008). In this study, the concept development of peri-urban agriculture concludes on the need for a move towards an agricultural urbanism. The planning of the spatial development of towns should now include aspects of peri-urban agriculture. This is not only due to the intensity of this activity but also because of the important role it plays in providing the urban areas with basic farm produce. This agriculture provides food and other needs to the urban population. With this activity the supply of perishable vegetable is assured for the town dwellers. According to Smit 1996, peri-urban agriculture is a significant source of employment especially among the urban poor with very little resources.

Urban policy needs to recognize the importance of this sub sector. A Food and Agriculture Organisation, FAO study (2007) estimated that of the almost 800 million people working in urban agriculture in 1996, a majority were minimum wage earners in developing countries. It also stated that this number is on a constant rise as the world's urban population is constantly increasing. The FAO projected figures for 2020 indicate that 63% of the estimated world population of 7 billion will be found in urban centres. Agriculture is a dominantly rural activity but today it has been observed that urban agriculture with peri-urban agriculture inclusive has a very important role to play in the socio economic survival of the urban population.

The many reports of the agricultural shows held in Cameroon since 1974 showed that peri-urban agriculture is an activity to be promoted. When statistics show that four out of every five Cameroonian is engaged in agriculture, those of the peri-urban zones are included, (UNDP, 1999). The Cameroon agriculture policy document for 1999, evaluated and revised in 2005, recognised the contribution to the agriculture sector by peri-urban agriculture. In 1999 the policy document identified the need to improve on peri-urban agriculture. It stated clearly that integrated programs will be put in place in peri-urban areas associating agriculture, small scale livestock activities and fish farming depending on the existing situation which will be consolidated and developed so as to create employment possibilities and develop supply of food stuffs, (Minagri, 1999). See Table 1.

**Table 1: Some major food crops productions in some divisions of the administrative Centre Region of Cameroon in tons**

| Food crops | Mefou and Afamba |       | Mefou and Akono |       | Mfoundi |       |
|------------|------------------|-------|-----------------|-------|---------|-------|
|            | 2010             | 2011  | 2010            | 2011  | 2010    | 2011  |
| Cassava    | 51822            | 91761 | 21227           | 44774 | 8725    | 9761  |
| Plantain   | 47294            | 77995 | 11839           | 16536 | 1920    | 11475 |
| Okra       | 39               | 55    | 39              | 1526  | -       | -     |
| Palmoil    | 1692             | 1793  | 1750            | 2284  | 355     | 376   |
| Cocoyams   | 162              | 2180  | 103             | 2544  | 152     | 330   |
| Calocassia | 2696             | 4784  | 2209            | 3819  | 272     | 3248  |
| Maize      | 3593             | 5952  | 3768            | 3991  | 2329    | 4467  |
| Pepper     | 669              | 1018  | 12              | 1526  | -       | 30    |

Source: Compiled from *Annuaire des statistiques du secteur agricole, campagnes 2007/2008 et 2009/2010*.

In 2005 when the 1999 agriculture policy was evaluated, it was observed that not much has been done in this sector. Efforts put in place by the stakeholders in this sector in Yaounde especially in the swamps around Yaounde have yielded positive results with poor Yaounde dwellers consuming disproportionately high percentages of leafy vegetables they cultivate, (Ndi, 2009). Production of food crops in the three divisions that make up the Yaounde-Nsimalen area has had an increasing trend since 2010 as shown on table 1.

This study posits that there is an important socio economic impact of peri-urban agriculture on both the farmers who reside in Yaounde, the urban centre and an environmental consequence on the Nsimalen area, the peri-urban zone of Yaounde.

## **1. The spatial context: Nsimalen, the peripheral area of Yaounde, its surrounding population and agricultural activities**

Yaounde, the political and administrative capital of Cameroon had a population of 300,000 people in 1976. This population in 2010 was 1.817.524, (MINEPAT/BUCREP, 2010) and is at a constant increase. Its pressure is not only directly exerted on the increase demand for farm produce from the rural and peri-urban areas but also indirectly reduces urban fallow land through building development. This represents an immense challenge for food security, sanitation and poverty alleviation, especially as the food supply is still decreasing and the proportion of undernourished people living in this city is on the rise. With this increase in population, demands for farm produce equally increases. Part of the population is forced to depend on food aid and imports for since the countryside are not able to constantly supply this growing food need. There is therefore need for extra-cultivation to help close the gaps that exist between demand and supply. In apparent reaction to the increasing urban population, peripheral farming systems with their distinct characteristics have emerged and are assuming great importance in this sector.

As Rakodi commented in 1998, there is need for more efforts in research that focuses on peri-urban areas with a link to urban poverty. This study has some urban poverty relevance as it treats the socio economic impact of this activity. Several studies (Entieu 1982; Voufo 1984; Nyonta 1994; Dabou 1997; Mewiba 1997 and Amougou 1999) concluded that farming in and especially around towns in Cameroon are increasingly gaining significance. A situational analysis of peri-urban agriculture in the Yaounde-Nsimalen area may be a base to projects that can contribute to the improvement of the socio economic conditions of the farmers and understand its environmental impact. Based on the fact that this study is a situational analysis, data and information on the socio economic condition of farmers and the impact of their activity on the environment were collected using several research methods presented in the section on materials and methods. Administratively, the Mfoundi, Mefou and Afamba and the Mefou and Akono divisions covers the Yaounde-Nsimalen area with about 625 km<sup>2</sup>. The study area is delimited on figure 001.

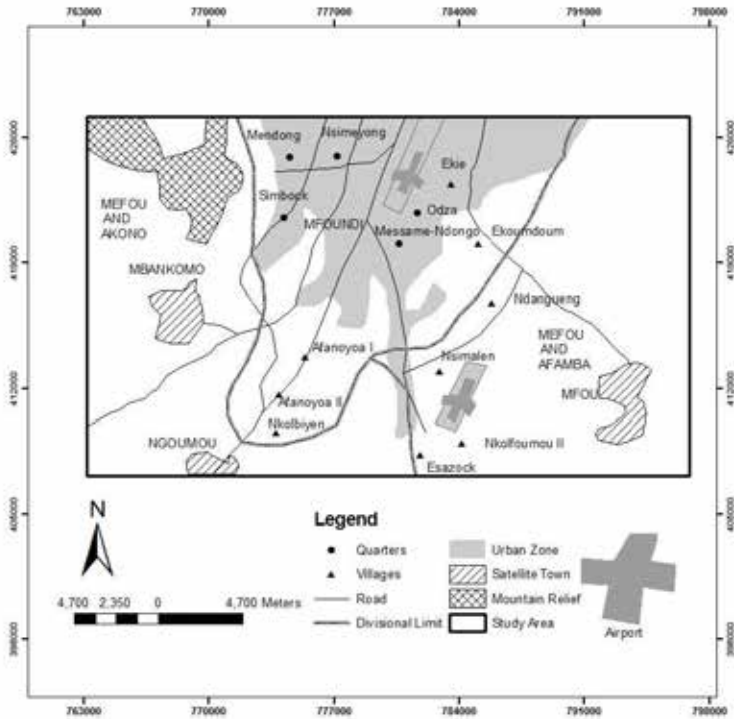


Fig. 001: The peri-urban zone of Yaounde-Nsimalen. Source: Field survey, 2009/2010.

## 2. Concept development. Peri-urban agriculture in urban agriculture: the way towards an agricultural urbanism

This study has as operational concept, peri-urban agriculture. Peri-urban agriculture is a part of urban agriculture. The link in both concepts is the fact that urban agriculture has as sub element, peri-urban agriculture. Mougeot, 1999 had a global consideration of these two concepts. Urban agriculture was considered by him as an industry located within (intra-urban) or on the fringe (peri-urban) of a town, an urban centre, a city or metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, using mainly human and material resources, inputs and services found in and around that urban area and in turn supplying human and material resources, outputs and services largely to that urban area. Aspects like food crops production, livestock rearing and tree growing for fuel wood within the city and in the peri-urban areas identified by Mieri et al, 2009, Mougeot, 1994 and Chipo, 2004 were cited by Ndi, 2009.

Ndi, 2009 identifies the fact that authors have varied considerations on the meaning of urban agriculture but they all accept the fact that it is practice within open

spaces in the city and on the peri-urban zone. While intra urban agriculture takes place within the city, peri-urban agriculture takes place at the periphery, thus the term peri-urban agriculture for this study. Peri-urban agriculture has the specific characteristics in that it takes place in a specific zone, a zone where the urban meets the rural. Agriculture is a dominantly rural zone activity. There is nevertheless urban agriculture as presented above. But when it is practiced at the fringe, it is peri-urban agriculture.

It should be noted that there is a very large disparity in both the spatial zones covered and the types of crops cultivated from one country to another, from one urban area to another and even from one geographic zone to another. Urban agriculture is increasingly understood as key to guaranteeing food security, especially for the urban poor (Laquinta D. L. and Drescher A. W. 2000). The quantity and quality of crops cultivated is significant and feeds a good number of people. Peri-urban agriculture contributes therefore to the functioning of the urban area as an agricultural zone. Peri-urban agriculture is carried out for personal consumption and also for commercial purpose and is practiced in the peri-urban zones by both those living in the heart of the town and those living at the periphery.

The intensity and important role of peri-urban agriculture has led to its new vision, that of being fully integrated into urban planning and design. According to Boucher, 2009, the importance of peri-urban agriculture can today be recognized by its full insertion into urban planning. This brings to light the concept of agricultural urbanism which takes into account the activities link to agricultural production such as cultivation, transformation, transport, distribution and sales. This concept according to Boucher, 2009, conceives the insertion of the agricultural function fully on a territory; land for agriculture located in the urban or peri-urban area.

### 3. Materials and methods

Primary and secondary data were collected to attain the objectives of this study. Agriculture is a very sensitive activity especially today with the cry of food scarcity and the increase in the prices of farm produce and other basic necessities in most countries of the world. A review of existing secondary information especially in the Ministry of Agriculture and Rural Development provided an insight of the situation of agriculture in Cameroon and in the Centre region in particular. Statistics on agricultural production was collected from the Agriculture statistics service of the above ministry. Nevertheless there was a need for primary data and so an interview schedule was prepared as well as observation of farms for that purpose. This completed the data and information collection exercise. The questionnaire was administered to a total of 50 farmers in the study area, randomly selected from seven localities in the area (Esazock, Mendong, Ngoumou, Nsimalen, Mfou, Odza and Messame Ndong). These localities were chosen from the three divisions that make up the study area. Interviews were equally conducted in some markets in Yaounde but not necessarily within the confines of the study area. Interview schedule for the study was developed based on the study objectives. The administration of the questionnaire was done alongside field observations carried out mostly in the farming area. Field observation was a complement to the already collected secondary and primary data.



The framework for analysis adopted for this study is in line with those identified by Binns and Lynch, 1998 in studies of urban agriculture. It includes the nature and extent of agricultural activities, the actors involved, production and marketing as well as socio economic and environmental implications.

## Results

### 4. Peri-urban agriculture in the Yaounde-Nsimalen area: multiple crop types cultivated by farmers of diverse origin

Peri-urban agriculture intensified in the Yaounde – Nsimalen zone after the economic crises of 1986/87, (Minagri, 1999). This crisis was caused by a reduction in the prices of coffee and cocoa, which the country depended on for foreign earnings. As a result there was a drastic slash of civil servants' salaries. The socio economic situation dropped drastically in January 1994 when the CFA Francs was devaluated by 50%. In order to mitigate the effects of these crises, many urban dwellers sought for land to cultivate crops. Subsequently, the number of city dwellers who sought for land increased the intensification in the practice of agriculture in the peri-urban areas of Yaounde, particularly in the Yaounde-Nsimalen zone. In this zone, peri-urban agriculture involves the cultivation of maize, cassava, groundnuts, soya beans, tomatoes, conventional vegetables like cabbages, lettuce, huckleberry and celery and leafy vegetables like folong (*Amaranthus spp*). There is also the practice of poultry and fish farming, (Minagri, 1991) The Yaounde-Nsimalen farmers use by-products, poultry manure, saw mill waste, brewery refuse and household refuse for fertilizers. As a result people now specialise in the buying and selling of brewery wastes from Cameroon Brewery while others specialise in selling fowl droppings from poultries in the zone. The farmers come from diverse origins. An analysis of the origin of the farmers in the study area show that 62% of them do not originate from the regions where they farm. That is, they are not the indigenes of the area and they do not even live there. Table 2 shows the origin of farmers in this peri-urban area.

**Table 2: Origin of peri-urban farmers in the Yaounde-Nsimalen zone**

| Villages       | Number of locals | Percentage of locals | Number of non-locals | Percentage of non-locals | Total     |
|----------------|------------------|----------------------|----------------------|--------------------------|-----------|
| Esazock        | 3                | 6                    | 5                    | 10                       | 8         |
| Mendong        | 3                | 6                    | 3                    | 6                        | 6         |
| Ngoumou        | 3                | 6                    | 7                    | 14                       | 10        |
| Nsimalen       | 4                | 8                    | 6                    | 12                       | 10        |
| Mfou           | 2                | 4                    | 4                    | 8                        | 6         |
| Odza           | 2                | 4                    | 3                    | 6                        | 5         |
| Messame-Ndongo | 2                | 4                    | 3                    | 6                        | 5         |
| <b>Total</b>   | <b>19</b>        | <b>38</b>            | <b>31</b>            | <b>62</b>                | <b>50</b> |

Source: Field work, 2010.

From table 2, it is evident that 62% of farmers are non-indigenes of the zone where they farm. The table also shows that Ngoumou and Nsimalen have the highest percentages of non-indigene peri-urban farmers. This can be explained by the fact that Ngoumou, the headquarters of Mefou and Akono division, is inhabited by many non indigenes especially the civil servants who work there and are involve in this activity. The airport has attracted them to Nsimalen and they now carry out peri-urban agriculture permanently.

Different groups of people like the unemployed, retired and active civil servants carry out this activity. A majority of the farmers are either unemployed or retired workers while some are active civil servants. These civil servants are struggling to contribute to the feeding of their families while reducing the money spent on food crops. The farmers who are actively in a formal service go to their farms depending on where they stay as early as 6 am each morning. They go at times with their wives and children and have farms ranging from  $\frac{1}{2}$  to several hectares located away from their homes in Yaounde. They work for at least an hour before going to their formal job site. It should be noted that many civil servants in Cameroon go late to their offices. They acknowledge the fact that theirs farms are of great help to them. The farms have contributed to greatly reduce the expenditure they would have regularly incurred on such farm produce like maize, cassava, sweet potatoes and other food items. Several farmers also acknowledged going to their farms after returning from their job site at about 4 p.m. They also spend all of Saturday and Sundays for non Christians on the farm. From observation of those involved in agriculture activities in the study area, there is no sex, age or social discrimination. Involved in this activity are men, women, children, the employed, unemployed and retired workers. To begin this activity one needs acquire a piece of land either by inheritance (10%) renting (50%), buying (30%) or by free acquisition (10%) from a friend. Tools used to cultivate in this region depend a lot on the sizes of farms and includes cutlasses, hoes, watering cans, rakes and water pumps/pipes.

## 5. A high variation of farm parcels

The sizes of parcels vary from  $\frac{1}{2}$  to several hectares. This depends on the availability of land, the financial situation of farmers, the nature of the land inherited as well as the availability of a friend to give out the land for free exploitation. A high income farmer will easily rent more farmland than those who are of a low income. The land that is freely obtained is usually small, likewise that which is bought by farmers. In swampy areas where market gardening is practiced, there are small parcels of land occupied by many farmers. This is because swamps are favourable for such an activity. Often farmers with the largest parcels of land are indigenes. They usually acquire such large parcels of land through inheritance from their late parents. In peri-urban agriculture in this area the size of the land determines the type of labour force to be employed.

Family labour is generally used in this area. From field survey, 86% of farmers acknowledge the use of family members (children, sisters, brothers) to provide the necessary labour force needed.

There are also workers hired to provide labour force. Field survey show that 10% of the farmers use salaried labour. That is, they pay people to work in their farms. This

is usually the case with large proprietors who do not only concentrate on cultivation but also depend equally on the rearing of fowls and pigs. Examples of such labour force are used in the Ferme Zion at Nkolinda and farms/poulturies at Minken.

Farmers come together to work in their farm. This concerns just 4% of the farmers. This is usually organised by women's associations or amongst friends. In group labour, collective works are organised in turns from one group member's farm to another. Usually the work done per day is very encouraging and can take more time if done by a single person.

## **6. Peri-urban agricultural calendar: an all season activity for the household and for the market**

It is worth noting that peri-urban agriculture in this area depends on rainfall. Nevertheless the agricultural calendar is made up of two periods of cultivation. Crops are cultivated in the months of March and April and in August each year. It is because this area's rainy season is in two phases. Crops like cassava, plantains, coco yams and yams are cultivated once a year while market gardening produces are cultivated throughout the year. This is because it is practice in swampy/marshy areas. It is intensified in the dry season due to the absence of floods that often destroy farms in the rainy seasons.

About 60% of the harvests are destined for the market while the rest are for home consumption. Several farmers in the Nsimalen area affirmed the fact that they hardly go to the market to buy vegetables. Their farms provide enough vegetables throughout the year for their households needs". In the Yaounde-Nsimalen zone, vegetables like Folong (*Aramanthus spp*) cabbages, lettuce, celery, huckleberry and other crops like tomatoes, Soya beans are cultivated for the market and for household consumption. Agricultural activities in the Yaounde-Nsimalen area have been carried out for a very long time. The figure 002 gives an insight on the spatial evolution of agricultural activities on this peri-urban area of Yaounde.

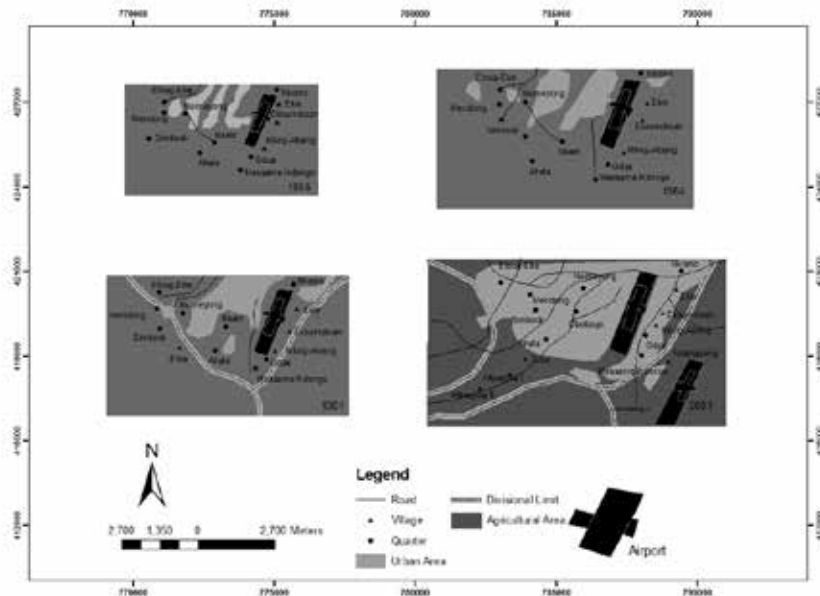


Fig. 002: Evolution of agricultural space exploitation in the Yaounde-Nsimalen area.

Source: Field survey, 2010.

The intensification of agricultural activities in the Yaounde Nsimalen peri-urban area has both a socio-economic and environmental impact.

## 7. Direct economic impacts of peri-urban agriculture in the Yaounde-Nsimalen area

Peri-urban agriculture contributes to supply the towns with food crops. It is located at the fringe and concerns several crop. Its location ensures easy access to services and markets, but it is also a source of pressure on resources while being a source of income to those involved in it.

### a) A source of employment

Up to the end of the 1980s, the scale and intensity of peri-urban agriculture practiced in the Yaounde-Nsimalen zone was mostly reserved for women. Agriculture was even looked upon by the people of Yaounde as an activity that was destined for the people of the countryside. However, at the beginning of the 1990s agricultural activities intensified in this area due to the economic crises and the fall in cocoa prices, which was the main cash crop cultivated in Cameroon. Presently in this area, agriculture constitutes the major activity for both men and women and especially the

unemployed. Due to unemployment, they are obliged to be in their farms on a constant basis. Farmers reside in Yaounde and work on their farms in the Nsimalen area almost on a daily basis. Those who are employed work in the morning, others in the evening and they all share Saturdays and Sundays depending on their faith. Field survey show that 66.7% of the women carry on farming on a permanent basis. Farming is their main activity. For the men, 75% do consider agriculture as their main activity. This is the only source of family income. They all consider their farms as their office without which their children will not be able to go to school, will not have any medical care and will not eat. All their entire life is base on the cultivation of corn, beans, cassava, which they sell directly in Mvog-Mbi market. At the end of the year, they realize individual savings of more than 500 000 FCFA. Those who are employed consider it as a support to their salary. They no more buy vegetables and other crops (or they buy just a small quantity).

In this region, self employment is not the only mode of employment. People are recruited elsewhere to work as labourers in farms. This is the case with Ferme Zion at Nkolnda with a combination of poultry farming and crop cultivation. The owner works alongside 4 men employed. These men depend entirely on this for a livelihood. At the poultry at Minken, there is a combination of pig, rabbit and fowl rearing with the cultivation of fruits such as pineapple and other crops like maize and beans. Vegetables and tomatoes are equally cultivated in this farm. The six young men who work here depend solely on the salary that is received at the end of every month. Some of these workers live in Yaounde and go to the farms daily. It is thus not only an employment but a good source of revenue.

## b) Source of revenue

Urban agriculture is an invaluable source of income for poor urban population, (Ndi, 2009). The profit that accrues from agricultural activities is a means of survival to those involved in it. Their revenue is not stable and fluctuates according to seasons. Nevertheless, the income from the sale of harvested produces is spent directly to purchase household needs, though it is very difficult to evaluate the real amount a farmer involved in peri-urban agriculture can earn per year. From the field survey conducted in the Yaounde-Nsimalen area, revenue approximations were gotten as shown on table 3.

**Table 3: Farmers revenue estimates in the Yaounde-Nsimalen peri-urban area**

| Revenue estimates (in FCFA) | Number of farmers | Percentage |
|-----------------------------|-------------------|------------|
| Less than 100 000           | 12                | 24         |
| 100 000 - 250 000           | 30                | 60         |
| 250 000 - 500 000           | 5                 | 10         |
| More than 500 000           | 3                 | 6          |
| <b>Total</b>                | <b>50</b>         | <b>100</b> |

Source: Field work, 2011.

Analysing table 3, four categories of revenue earners in the Yaounde–Nsimalen area can be identified.

There are low revenue earners from agricultural activities. It is less than 100 000 FCFA per year. This is the case of those who produce crops to satisfy their family's consumption needs. They sell only in times of excess or when need arises. Twenty-four per cent of farmers are found in this category.

There are also average revenue earners from agricultural activities. Their revenue is situated between 100 000 – 250 000 FCFA and concerns 60% of the farmers. The average nature of this revenue is due to the fact that cultivation depends on rain and thus, not very remunerative. This is because much of the crops produced exist in the market at the same time bringing about low prices hence less income for farmers e.g. maize during the month of June and July.

There are also high revenue earners from agricultural activities. About 10% of the farmers belong to this category. They have annual revenue of 250 000 – 500 000 FCFA. The farmers in this category are those who practice market gardening and produce highly needed food crops such as leafy and conventional vegetables, spices, okra or maize that is cultivated in the dry season.

There are very high revenue earners from agricultural activities. In this category, there are just 6% of farmers. They constitute experienced market gardeners who are equally involved in rearing. Their annual revenue is more than 500 000 FCFA.

## **8. Indirect economic impacts of peri-urban agriculture in the Yaounde-Nsimalen area to other town dwellers**

Other town dwellers benefit indirectly from peri-urban agriculture activities in this area. They provide several services to complete the cultivation, transportation and marketing of farm produce. The most important are retailers and transporters.

### **a) Retailers: “buyam sellam” of the Yaounde-Nsimalen area**

Retailers are mostly town dwellers and commonly called “buyam sellam”. They serve as middle men between the farmers and the consumers. They thus play an intermediary role between producers and consumers. They buy from farmers and sell directly to consumers or sell to other retailers who finally sell to consumers. They buy in the area of production, that is, in the farm or are supplied in the market. About 60% of farmers affirm that some times all of their produce are sold to “buyam sellams” who buy in place.

Though it was very difficult to select those “buyam sellams” who buy their produce solely from the Yaounde–Nsimalen zone, many selected at random in the Mvog-Mbi, Acacia, Mfoundi and Melen markets in Yaounde town stated that they buy from the study area and that the buying and selling of farm produce is the only means of earning a living to them. Without the cultivation of these produce in the Yaounde–Nsimalen area, these men and women would not have enough to sell. The farm produce are transported to Yaounde town.

## b) Transporters: the bush taxis' contribution

Through peri-urban agriculture activity practiced in the Yaounde–Nsimalen zone, other indirect actors equally benefit. Such actors have an indirect source of revenue for their family upkeep. This is the case of the drivers of the bush taxis commonly called “opeps”. They transport the produce from the farms to the various markets and are paid. Without this activity, it would not be possible for them to earn a living. For example, to transport a farmer from Ngoumou to Mvog-Mbi market, the farmer is expected to pay 1100 FCFA as his fair and 300 FCFA for a bag of any harvested produce, (vegetables, maize, cassava, cassava paste, etc). The drivers affirmed that this is their sole activity and source of income for their families. The owners of such vehicles resident in towns like Ngoumou affirmed the socio economic importance of this activity to their families. Though the revenue varies during the year, they nevertheless can provide for their families.

## c) Service providers for fowl droppings

Another group of service providers do benefit from this activity. They are involved in the sale of manure that is used especially by the market gardeners. This manure is obtained essentially from fowl droppings in poultries (Ferme Zion and that at Minken). A bag is sold at 7000 FCFA. They buy and retail these produce to farmers. Retailing is done with the use of buckets ranging from 5 litres to 10 and 15 litres. These service providers have the sole right to collect fowl droppings from the Ferme Zion at Nkolnda and that at Nloevoe which they then sell to the farmers.

## 9. Introduction of new crops and change in living standards

The town dwellers who are farmers in the Yaounde–Nsimalen zone do not only depend on the cultivation and sale of food crops. There has been a continuous involvement in the cultivation of what were formerly considered as urban crops. A study carried out by the National Institute of cartography in 2005 showed that a good number of new crops have been introduced in this zone during the last ten years. These crops were brought in by 30 of the 100 households farming in the zone. They are mostly fruits such as pineapples, guavas, paw-paw, and palm nuts, market gardening produce as soya beans, tomatoes, watermelon and okra. The proportion of each new crop introduced is shown on Figure 003.

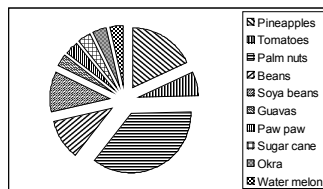


Fig. 003: Proportion of new crops introduced in the peri-urban area of Yaounde-Nsimalen.

Source: INC, 2005.

In the Yaounde-Nsimalen area much attention is paid to products that are easily sold both in Yaounde and in other local markets. With this, the families of the farmers have a steady income and this is reflected by an increase in the number of children sent to school, increase in medical care for families and diversification of family dishes.

In effect, the living conditions of Yaounde town dwellers who are farmers in the Yaounde-Nsimalen area have been improved due to the constant source of income that is gained from the sale of agricultural produce, cultivated in place. The intensification of this activity has also an environmental impact.

## **10. Environmental impacts of peri-urban agriculture in the Yaounde-Nsimalen area**

Though peri-urban agriculture is a source income to all those who are involved in it, it is equally a source of pressure on the environment in the area where it is practiced. Several environmental effects were identified in this area.

### **a) Reduction in forest cover**

The Yaounde-Nsimalen area was originally covered by the dense humid semi-deciduous forest of the Guinea-Congo type (INC, 2005). Cocoa was planted amongst trees found around houses. With the economic crisis of the 1980s and the fall in cocoa prices, many people involved themselves in food crops cultivation. With this, new parcels of land were sought for and this was done to the detriment of forest since it was cleared to have this land. Clearing is mostly done with the use of cutlasses and fire and in some areas, chain saws. With an increasing population both in the rural and urban areas (Yaounde) there is an increase demand for farm produce, and so more land is needed. This land can only be gotten through the clearing of forest. Forest is not only cleared for cultivation but equally for the building of houses and roads as well as forest logging. From the peri-urban zones to rural zones, there is a gradual move from degraded forest or bare surfaces to less degraded forests or patches of dense forest.

### **b) Animal species extinction**

With forest destruction, several animals are no more found in the Yaounde-Nsimalen area. The people of the area affirmed that there were chimpanzees and gorillas in this area, but today none can be found. This is due to the continuous peri-urban agricultural activity and proximity of this region to the political capital, Yaounde. The fauna now in this region is essentially constituted of rodents and small reptiles (snakes, lizards).

### **c) Soil degradation**

Though soil tillage is indispensable for food crops cultivation, it affects the soil of the Yaounde-Nsimalen area. This is aggravated by the intensity of this activity which is increasing every year due to increased demand for food crops that are cultivated in this



region. The farmers use the popular slash and burn method. This leads to the exhaustion of soil nutrients, (Amougou, 1999). This exhaustion of soil nutrients is equally accelerated by continuous cultivation since farming is done all year round. With the passage of time, yields become low and so new areas are colonised, still to the detriment of the forest. The superficial materials of the abandoned areas are washed away by agents of erosion (especially rain water) since the soil has been loosened up by the tillage. Most of this material is deposited in the surrounding low lands and swamps.

#### **d) Disappearance of marshy lands**

Swampy zones that are usually considered as part of the private domain of the state are ecological zones with unique characteristics. In the Yaounde–Nsimalen area as well as elsewhere in the capital city, there is a gradual occupation up of marshy zones. This land is taken up for the practice of market gardening. In the Yaounde–Nsimalen area, swamps and valleys at all periods of the year are seen to be green. This is because of the continuous cultivation of perishable produce that have a ready market in Yaounde. This area has witnessed the cultivation of several types of vegetables and other food crops. Since these produce need constant water and swampy zones having just that, they serve as the best sites for their cultivation. As the produce fetches a ready income, there is almost no swamp in the Yaounde–Nsimalen area that has not been occupied. This is nevertheless against the law since it is state land and thus no activity is supposed to be practiced therein. Not only is the peri-urban agriculture colonising swamps, it has been noticed that building of houses is equally playing a remarkable role in the reduction of swamps in the Yaounde–Nsimalen area. Just like on the slopes, rainwater usually washes the soil and the material is deposited in these swamps thus filling up of the latter. If these activities continue at its present rhythm, swampy lands in the Yaounde–Nsimalen area will all disappear in the near future causing an ecological loss. There is need for action by the administration, NGOs and the local population to remedy this situation.

### **Conclusion: the need for peri-urban agriculture urbanism**

The result of this study on the analysis of the socio economic and environmental impacts of peri-urban-agriculture by Yaounde town dwellers in the Yaounde–Nsimalen area is very revealing. Town dwellers who are farmers are involved in crop production as well as others like retailers, transporters and truck pushers, all of them benefiting economically from this activity. It has also been observed that it changes the living standards of the families of the farmers. However, this activity has its negative effects on the environment. These negative effects or impacts to the environment that have been noticed in the Yaounde–Nsimalen zone include the reduction in the forest cover, the disappearance in animals species, the disappearance of swamps and soil degradation. With this, there is need for a better management of this area and therefore the support project on the development of the Yaounde–Nsimalen area is of prime importance. This should open the way for an integration of peri-urban agricultural activities in this and other areas in the urban development plans.

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