

## TECHNIQUES FOR THE PRODUCTION AND MARKETING OF PALM OIL IN GADOMEY (BOROUGH OF COME)

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### **ABSTRACT**

*The production of palm oil is facing enormous difficulties in the village of Gadomey. This is why this research aims to highlight the influence of this activity on the socio-economic life of the population of Gadomey.*

*The methodological approach consists of documentary research, field research with data collection tools and techniques, then the analysis and interpretation of the results using the SWOT model. A total of 127 people were surveyed in Gadomey 1 and 135 in Gadomey 2. This makes 262 people surveyed out of 1308, representing a rate of 20 %.*

*Data and information from documentary research and socio-anthropological investigations have shown that several steps are followed in the production of palm oil in Gadomey and it is after the second cooking that the producers manage to collect the so called "Zomi". In addition, the producers are mainly illiterate (56.15 %). Also, the palm nuts used for production are purchased by the majority of producers (65 %). Wholesalers and retailers are the marketers and they use more motorcycles (36 %) to go to places of exchange. The prices for both types of oil fall from January to May and rise from June to December. It is therefore noted that the price of "Zomi" is higher than that of standard oil in any period. The producers encounter difficulties which slow down the development of the sector throughout the process: the scarcity of the raw material, the rainfall deficit less varying between 850 and 1160 mm, the lack of technical and financial support, the high rate of literacy. It is therefore advisable that support for the sector is established so as to promote the development of this activity for the well-being of the population of Gadomey.*

**KEYWORDS:** *Gadomey, Comè, Production, Marketing, Palm Oil*

### **INTRODUCTION**

In developing countries, the agriculture remains the basis of the economy. According to the World Bank report (2010), agriculture occupies an overriding place in third world countries with more than 65 % of the active population and contributes for 32 % to the GDP growth of these countries. The FAO report (2001) emphasizes that it is essential that actions to fight poverty be turned towards the rural world.

However, Beninese agriculture, like that of most countries in sub-Saharan Africa, faces some problems (vagaries of the weather, land disputes, etc.) which slow down its development. West Africa, however, where most countries have an economy based on rain-fed agriculture, appears to be a region particularly sensitive to rainfall fluctuations. The very significant drop in rainfall observed in this region during the 1970s and 1980s had significant repercussions at the hydrological and agronomic level (Vissin, 2001). The consequences of food insecurity are felt with particular acuity as for the determining role of campaigns in supplying cities (Ogatcha, 2015).

However, palm oil production is the most profitable activity compared to other agricultural food producing activities (Fournier et al, 2000).

The crude palm oil also called "red oil" is extracted by hot pressing from the fruits of the oil palm. It is one of the staples of the diet of the Gulf of Guinea countries. It can be refined, and fits in this form on the list of ingredients of many food industries, in cosmetics, the production of biodiesel, etc. Palm oil is the most consumed oil in the world.

The production of the Gulf of Guinea countries in the world market has dropped considerably since the 1970s (Fournier S. et al, 2000). This is due to Asian competition, that of imported oils, rainfall deficits, etc. This glowing observation of the situation leads to the question of whether the palm oil sector in Benin still continues to improve the living conditions of rural populations. Who are the actors involved in this activity? What are the production techniques of palm oil in Gadomey and what is the quantity of oil produced by the processor as well as that produced by all producers? What is the impact of palm oil production on socio-economic life of producers and on the borough of Comè? What are the constraints that hinder the development of palm oil production in Gadomey?

### Presentation of the Study Area

Gadomey is a village in the borough of Comè. It has 5,566 inhabitants (RGPH, 2013). It is bounded to the North by the Municipality of Houéyogbé, to the South by the Municipality of Grand-Popo, to the West by the borough of Comè, and to the East by the borough of Agatogbo. With an area of approximately 27.79 km<sup>2</sup>, this village is located between 1 ° 52' and 1 ° 54' of north latitude, and 6 ° 32' and 6 ° 34' east longitude (Figure 1).

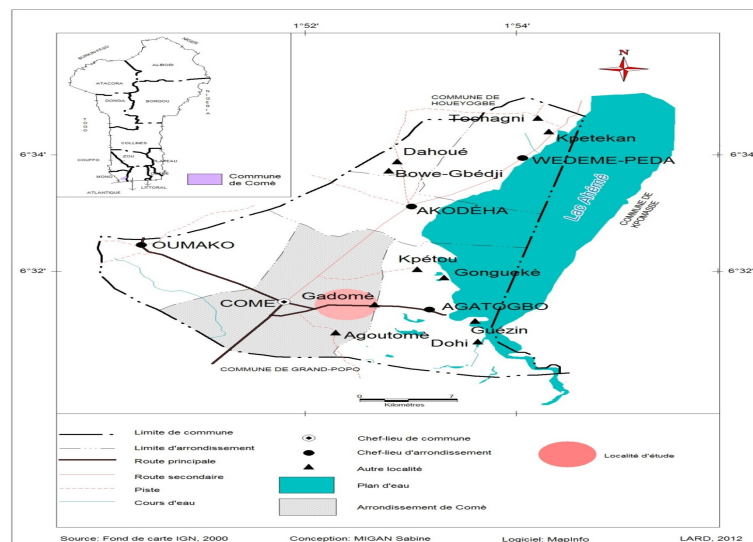


Figure 1: Geographical Location of the Locality of Gadomey.

## DATA AND METHODS

### Data

Several data were used in this research. These include:

- The demographic data from 1979 to 2013 (RGPH1, 2,3 & 4) collected at INSAE were used to know the population growth;

- The socio-economic data collected during field investigations were used to find out the techniques for producing palm oil, its impact on the socio-economic lives of producers and the constraints linked to its production and marketing.
- In addition, the observations made it possible to compare the practices with the speeches, the experiences and the declarations of the people interviewed during the socio-economic survey in order to collect socio-anthropological data.

## **Methods**

### **Data Processing and Results Analysis**

The data collected have been analyzed and the modalities of the questions have been codified appropriately. The data was then entered with the Epi-data software. A data entry base has been designed for this purpose. They were then exported as an SPSS and Excel database. These last two software packages were used for data processing. Data has undergone several forms of processing such as statistical processing, graphic processing and cartographic processing.

### **Results Analysis Models**

The diagnostic analysis of the results was carried out with the SWOT (Strengths-Weaknesses- Opportunities-Threats) or MOFF (Opportunities- Strengths-Weaknesses) model. This model has the advantage of synthesizing the strengths and weaknesses of a company with regard to the opportunities and threats generated by its environment. Indeed, the SWOT model is a strategic planning tool which allows the external diagnosis to be carried out (existing opportunities in the environment, economic and social treats) and internal threats (the key success factors in the studied environment). In this study, it made it possible to carry out an external and internal diagnosis of the production and marketing of palm oil in Gadomey.

In addition, it should be noted that in order to obtain convincing results on the production and marketing of palm oil, a survey was made in the localities of Gadomey 1 and Gadomey 2. The number of actors surveyed was determined by the following formula:

$$T = M \times F$$

With: T: Sample size; M: Population size; F: sampling rate fixed at (20 %).

The choice of these interviewees meets the following criteria:

- Be a producer of palm oil or palm nuts;
- Be a proven seller of palm oil. A total of 262 actors involved in the production and marketing of palm oil were surveyed,
- The data collection tools include the observation grid, the interview guide and the questionnaires. These tools made it possible to collect information using appropriate techniques, mainly:
  - Individual interviews were organized with key players (SCDA agents, local authorities) using an interview guide in order to collect information useful for achieving the objectives of the study;

## RESULTS

### Palm Oil Production Techniques in Gadomey

This is to present the actors involved in the production of palm oil, the techniques of harvesting, sale and supply of raw materials then the stages of production of ordinary palm oil and "zomi".

### Actors Involved in the Production of Palm Oil in Gadomey

The palm oil production involves several actors, namely: palm oil producers, palm oil processors and traders (Table 1). There are only seven producers with palm groves in the village, one hundred palm nut processors and eighty palm oil traders.

In addition, it should be noted that palm nut processing and palm oil marketing activities are reserved for women. Out of a hundred producers identified, only eighty producers market the obtained oil.

**Table 1: Distribution of Actors in the Production to Marketing Chain**

Area of Intervention	Men	Women	Place of Exchange and Work
Palm oil plantation	08	00	Gadomey
Palm oil production	00	100	Gadomey
Oil trade	00	80	Comè Market, Ouidah

Source: Field survey, December, 2017

### Techniques for Harvesting and Selling the Raw Material at Gadomey

The palm oil production is only possible if there is availability of palm nuts. It is therefore necessary to take into account the variety of the palm so as to obtain quality oil. Indeed, before cutting the diets, it is necessary to ensure the maturity of the fruits. To be sure of the maturity of a diet, one should notice fruits (12 or 15 nuts) detach from the diet. In addition, to cut the bunches, the majority of the pickers use the machete in the plantations. The bunch harvesting technique is the climb for natural palm trees, which is done using a rope made from the secondary branch of the palm leaf. Figure 2 shows the bunch picking technique on a selected palm tree.

This picture shows a man cutting a diet of palm nuts on a selected palm tree. After the harvest, producers call on palm oil producers to sell the bunches. For the sale, the owners use different measuring instruments which are: the kilogram, the bowl and the plastic.



**Figure 2: Harvesting Bunches on a Selected Palm Tree.**

Shooting: Migan, January 2018

### Technique of Palm Oil Production in Gadomey

The traditional processing of oil palm fruits is an activity exclusively reserved for women. The latter learned the trade from a relative: mother, grandmother, or another close relative. Producers have only one technique for producing red oil (zomi). The nuts used come 90 % from the palm of the dura variety and the remaining 10 % from the selected palm.

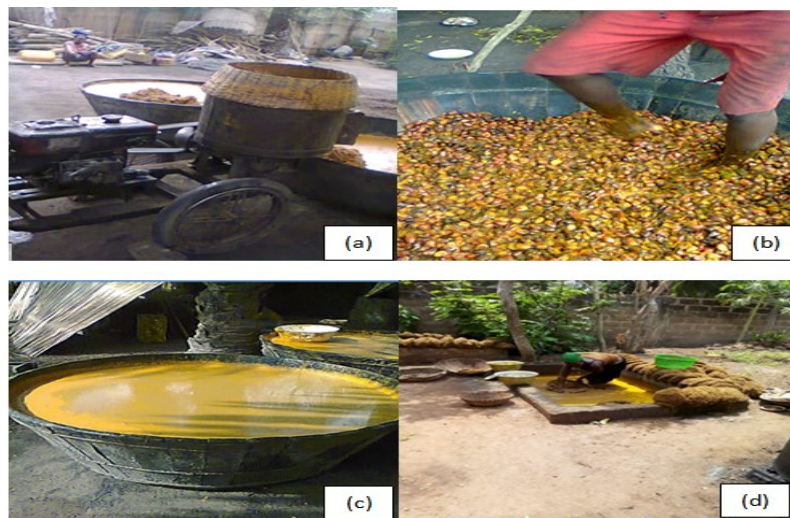
The oil production actually begins with the picking of the fruits after a storage period of four (4) days intended to facilitate the separation of the fruits from the bunch. To remove the waste, the women winch the fruit.

#### Cooking Fruit

The fruits are cooked in a metal barrel which is filled with fruit before adding water. The added water does not rise to the level of the fruit. This operation is most often done the day before the eve of the treatment day. They keep the fire going for about 3 hours, and then the barrel remains under the embers all night.

#### Mixing by Fulling or Using a Machine (Pulper)

The kneading is carried out by fulling on the feet (photo b) or using a pulper machine (photos a). The cooked fruits and the cooking water are poured into a circular container (photo c) in a 50 to 60 cm deep bank (capacity of 500 liters). When the slope of the land allows, a rectangular pit, dug in the ground, is sometimes made (photo d).



**Figure 3: Mixing Techniques.**

Shooting: Migan, January 2018

#### Partition of Fibers and Nuts and Hand Pressing of Fibers

The fulling detaches the fibers from the central nuts of the fruit. After a long sorting operation using a large mesh basket to rid the nuts of the fibers, the fibers can then be pressed directly by hand. They are compressed into balls. After drying, they will be sold. Before separating the fibers from the nuts, a handful of these fibers are reserved for the preparation of the oil.

The nuts will be spread out on a drying area. The oil that floats on the surface of the water is collected using a bowl or collected in the palm of the hands (Figure 4).



**Figure 4: Oil Recovery.**

**Shooting:** Migan, January 2018

### Oil Recovery

After a clarification of 20 minutes, the oil is scooped off using a bowl and filtered through a basket acting as a sieve which retains the few entrained fibers and the lumps (Figure 5).



**Figure 5: Filtering the Oil.**

**Shooting:** Migan, January 2018.

### Second Cooking

During this, the oil obtained after filtering is subjected to moderate heating with continuous and uninterrupted stirring. This allows evaporation of the water. This operation requires perfect control of the hearth so as to avoid oil calcination. They add 1.5 liters of fruit cooking broth, the fibers previously set aside when the fibers are separated from the nuts, as well as a handful of salt.

The above table shows that ten (10) palm nut plastics are required to fill a barrel and 30 bowls of palm nut for a barrel.

In times of abundance, a barrel of palm nuts gives one (01) can of 25 L of palm oil; and three (03) barrels of palm nuts are needed (30 plastics or 90 bowls) to obtain two (02) cans of 25 L of palm oil in times of scarcity.

The oil obtained is zomi (quality oil). Table II presents the quantity produced by measurement.

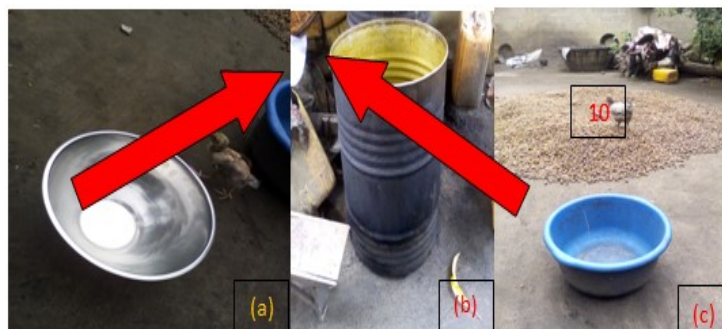
**Table 2: Quantity Produced by Measure**

Measure	Periods	Number Per Barrel	Oil Quantity
Plastic	Abundance	10	one (01) can of 25 L
	Shortage	30 with 3 barrels	two (02) cans of 25 L
Bowl	Abundance	30	one (01) can of 25 L
	Shortage	90 with 3 barrels	two (02) cans of 25 L

Source: Field surveys, July 2018

In addition, the abundance period is from February to May and the shortage period is from June to January. Plate 2 shows the different measures used:

The analysis in Figure 6 shows the bowl (photo a), the barrel (photo b) and the plastic (photo c). The bowl and the plastic are buying palm nuts. The bowl is used in Comè but the plastic is used in Kpomassè and Kpassè. It takes 30 bowls or 10 plastics to fill the barrel.



**Figure 6: Production Measures.**

Shooting: Migan, July 2018.

## SOCIO-ECONOMIC IMPACTS OF PALM OIL PRODUCTION IN GADOMEY

### Economic Impacts of Palm Oil Production in Gadomey

The marketing of palm oil provides significant income to stakeholders. The selling price of palm oil varies from one period to another and from one type of palm oil to another. The periods are: February to May and June to January (Table 3).

Table 3 shows that the selling price of palm oil varies from one period to another and from one variety to another. From February to May, the sale price of 25 L of Zomi (quality oil) is between 17,000 FCFA and 18,000 FCFA with an average of 17,500 FCFA and standard oil costs between 14,000 FCFA and 15,000 FCFA with an average of 14,000 FCFA. From June to January, the sale price of 25 L of Zomi (flavored oil) is between 20,000 FCFA and 25,000 FCFA with an average of 22,500 FCFA and standard oil costs between 17,000 FCFA and 20,000 FCFA with an average of 18,500 FCFA.

In addition, they make between 10 % and 20 % of profit on a 25 L can. It is necessary to remember that the period from February to May is that of abundance and from June to January is that of scarcity. Producers have reported that from March to the end of May, they keep 50 % of their produce each time to resell it a bit expensive during the shortage period. In July, 25 L of zomi already costs 20,000 FCFA and standard oil costs 17,000 FCFA. It is only the large producers who manage to conserve half of their production. Figure 2 shows the palm oil marketing circuit in Gadomey.

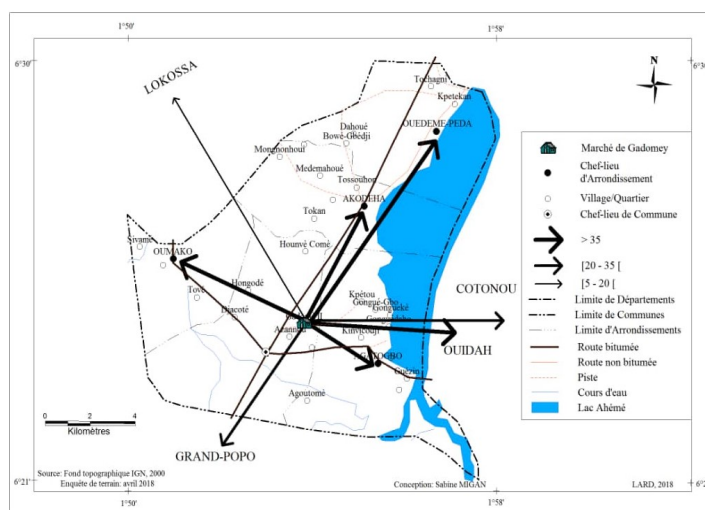
The analysis of Figure 7 reveals that the wholesalers come more from Ouidah, Kpahou and Cotonou. In addition,

they also come from the neighboring districts of Comè and Grand-Popo and rarely from Lokossa.

**Table 3: Evolution of the Selling Prices of Palm Oil in One Year**

Periods	25 L Sale Price in FCFA	
	Zomi	Standard Oil
February to May	1700018000	1400015000
June to January	2000025000	1700020000

Source: Field surveys, July 2018



**Figure 7: Palm Oil Marketing Circuit.**

Source: Field surveys, January, 2018.

### Social Impacts of Palm Oil Production in Gadomey

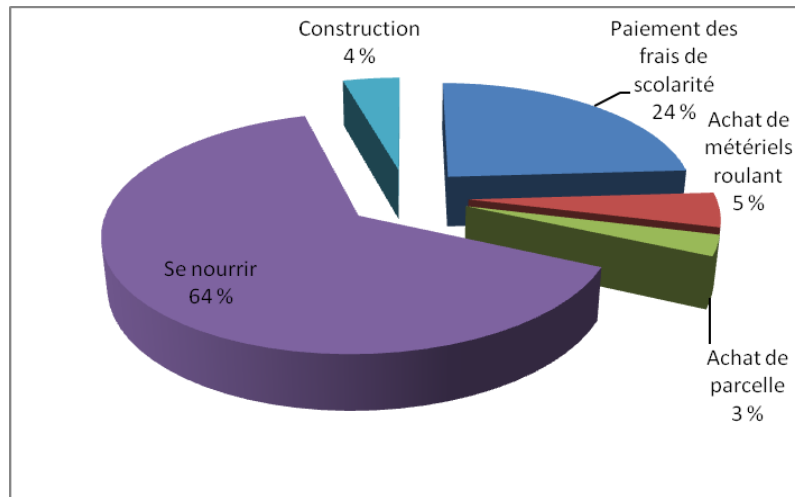
The production and marketing of palm oil occupy an important place in the lives of actors involved in this sector because they represent their main income-generating activity. In fact, more than 80 % of the income of palm oil producers comes from the exploitation of palm nuts. A quarter of the interviewed producers said they engaged in other income-generating activities. But these activities only provide them with 20 % of the total income. In addition, the palm oil production activity is, according to the producers, the only most profitable activity. Most of the women engaged in this activity do not have solid capital. They start their activity by being employed by those who produce a large amount of palm oil. They are often paid in kind (1L of oil / 25 L produced and a few bowls of palm kernel nuts, dried fibers and cake). It is after the sale of the products that they obtain income in cash. They use 50 % of the income to meet their various needs; the remaining half is saved in order to build up the capital to start their own activity. The employer women of hired labor are those who had a large turnover and can produce up to 40 cans of 25 L per week during the campaign period. But this is no longer the case today; they barely produce 10 cans per week in times of abundance because of the decline in their capital and because of the lack of palm nuts in the locality. The processing of oil palm fruits gives these women a certain autonomy (facing certain expenses without waiting for the husband, they no longer buy on credit or at least no longer pledge their personal effects or make more wear and tear before fixing certain financial problems).

Figure 3 shows points out that 64 % of producers use the income from production for food, 24 % of producers use their income to pay for the education of their offspring, 5 % of producers use the income to the purchase of rolling stock in



order to facilitate their mobility as well as that of their products, 4 % of those surveyed build housing with income from production and 3 % use this income for the purchase of plots.

Figure 8 shows the distribution of producers according to the use made of income from the palm oil sector in Gadomey.



**Figure 8: Distribution of Producers According to the Use Made of Income.**

Source: Field surveys, January, 2018.

## PROBLEMS RELATED TO THE PRODUCTION AND MARKETING OF PALM OIL IN GADOMEY

### Problems Related to the Production of Palm Oil in Gadomey

#### Water Supply

The problem of water supply is one of the concerns of women who devote themselves in this activity. There are not enough traditional wells in the area. Indeed, the presence of alluvium and the proximity of the Guézin valley make it difficult to drill traditional wells. In addition, the difficulties encountered when digging wells make the cost of drilling high in the locality. The high cost of installing boreholes does not allow all households to have access to these pumps owing to the precarious economic conditions of the population. Producers are forced to obtain free water from those who have traditional wells (these wells are insufficient and of poor quality), but sometimes buy water from cisterns. The purchase of water still contributes to the decline in income from the marketing of zomi palm oil.

#### Absence of a Group of Women Producers

There are a few groups of women (FG) producing palm oil in areas where this activity is the main source of income for these women. On the initiative of these, we often find Non-Governmental Organizations (NGOs) or Regional Centers for Agricultural Promotion (SCDA). In a month, these groups meet a certain number of days to work together. The working capital necessary for the activity is raised initially thanks to the contributions of the members, and the profits obtained after each sale are shared between them. The production of women's groups represents only a small part of all individual productions. But the women wish to participate because these groups are privileged partners of development organizations, of technical support, which grant those loans and subsidies. There is no real group in the study area. The producers affirmed the existence of a group; but internal problems such as the conflict between producers; work management;

financial management etc. stifle the proper functioning of that group. The absence of a reliable group in the locality leads to the absence of technical and financial support from financial and technical institutions.

### Problems Related to the Marketing of Crude Palm Oil in Gadomey

#### High Transportation Costs

The means of transport and communication channels facilitate palm oil distribution operations in markets such as: Comè, Ouidah, Dantokpa, Porto-Novo etc.

Today, due to the increase in the price of fuel, the cost of transporting the products has increased considerably leading to an increase in the selling price of palm oil.

This rise in the price of palm oil does not allow it to withstand competition from imported oils which are relatively cheaper.

It should be noted that the transport cost between Cotonou - Comè is two thousand (2000) CFA francs today against one thousand two hundred (1200) CFA francs in 2002 (survey of carriers, January, 2018).

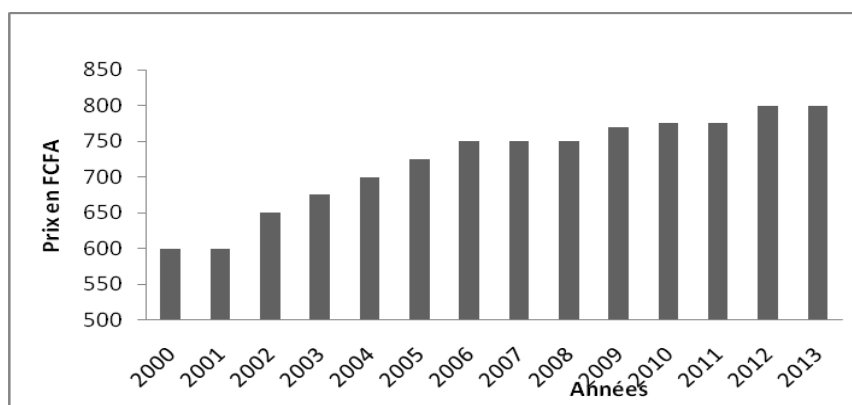
#### Increase in the Price of Palm Oil on the Local Market

The increase in the purchase price of the schemes and that of labor, as well as transport and other costs (water, firewood) push up the selling price of palm oil on the local markets (Ouidah- Kpahou-Dantokpa). Three hundred and fifty CFA francs per liter in 1990.

However, it should be noted that the rise in the CFA franc is rather favorable for palm oil (Fournier et al, 2002). This increase, which occurred in January 1994, made imported oils more expensive. Internal demand then increased while production remained unchanged due to the various problems encountered by palm groves in the locality.

Figure 9 shows the change in the selling price of Zomi palm oil from 1992 to 2018

Figure 9 shows that the price of zomi palm oil is increasing in the study area. Thus, the liter cost 600 FCFA in 2000. But this price increased to 750 FCFA from 2006 to 2008. This price went up to 800 FCFA in 2013. In addition, from 2016 to 2018, zomi costs between 1000 FCFA and 1500 FCFA.



**Figure 9: Annual Change in the Selling Price of "Zomi" Oil on the Comè Market**

Source: Field surveys, January, 2018

## **SUGGESTIONS**

### **To the ATDA**

ATDA can become more involved in the development of the local palm grove, the only source of income for these villagers. ATDA can: help these planters to resolve the various difficulties they face, carry out actions to train planters in the cultivation methods of oil palm and the use of chemical fertilizers, assist these planters in the fields each time, advise and support farmers for an irrigated crop.

### **To the Palm Oil Producers**

In order to develop palm oil and its by-products, producers should be trained by departments in charge of the quality of agro-food products. This training will take into account the choice of quality of nuts and method of conservation of the oil produced.

To enhance the palm oil produced in the locality, producers should choose ripe fruit, carefully sorted and store in a clean and dry place. They will clean utensils, containers and the pulper after each use. Producers will ensure that the water content of the oil is completely evaporated as it is responsible for the rapid degradation of the oil. They will store the finished product in clean cans, airtight containers to limit the risk of oxidation. Because, the conquest of the internal and external markets by the oil palm products of the study area requires that the products be of good quality and competitive on these markets.

## **DISCUSSIONS**

The analysis of the results made it possible to know that the production of palm oil in Gadomey follows several stages, namely: cooking the fruit, kneading by pressing or using a machine, separating the fibers and nuts and hand pressing of the fibers, recovery of the oil and it is at the second cooking that the Zomi is obtained. This is also attested by the results of the work of Toviho (2017); Akogninou (2017) who stipulated that the palm oil production process is carried out in several stages: having the harvest of nuts; baking, kneading and baking the substrate for oil extraction. This activity allows producers to satisfy basic needs. The same observation was made by Fraval (2000), who stipulates that the palm oil sector plays an important role for subsistence in rural areas of most developing countries. This leads large proportions of women to take an interest.

Oil palm is the raw material for producing crude palm oil, palm kernel oil and making palm wine. However, the limited number of existing palm groves in Gadomey does not satisfy all the producers of palm nuts. This situation is due to certain problems including rainfall, the land problem and the lack of technical support for planters. The same observations were made by Nkankeu (2008); Morin (2012) and Ogatcha (2015).

## **CONCLUSIONS**

To round off, it appears that most of the crude palm oil produced in Benin is supplied by the artisanal sector. This sector has been able to adapt to the competition from imported oils and to urbanization. Several types of innovation have guaranteed the population's commitment to crude palm oil. Artisanal palm oil production is largely carried out by rural women as it is the most profitable agricultural food product processing sector. Crude palm oil has the advantage of being a source of employment and independence for women in rural areas. The palm oil sector is one of the development and poverty reduction strategies. However, it faces some problems that prevent its development.

Therefore, it should be noted that the poor performance of the sector is explained by the difficulties in supplying raw materials, the total lack of support for small processing units, the lack of quality control of the oil produced by these units, the nonexistent technical contribution for the recovery of the oil produced. Indeed, in Gadomey, producers have enormous difficulties in supplying palm fruits, the main raw material for the production of crude palm oil, which reduces the number of producers each year. Difficulties in supply come from sources such as: aging and the reduction of natural palm groves; the high demand for raw materials; rainfall deficit; the land problem and the threat of small semi-artisanal processing units.

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