

# AN ASSESSMENT OF CITRUS FARMING IN NIGERIA

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**Abstract:** The study is an assessment of Citrus farming in Nigeria. The main objective of this research is to determine the socioeconomic importance of Citrus farming on farmers in Nigeria. Content analysis was therefore employed in the analysis as it offered the researcher the opportunity to synthesized the ideas and situate them in the right perspectives for the purpose of arriving at valid conclusion. Over 50% of the fruits produced in Nigeria are lost in transit between farms and major urban markets. It is believed that such losses are avoidable and result from the farmers/middle men's preference to sell at higher price in the markets rather than selling to processors without taking into account the cost of wastage. There is a need for efforts to be geared towards increasing production and curtailing post-harvest losses through proper value addition. Establishment of cold storage facilities across the country would greatly help in reducing wastes that accrue during the harvest season. The value chain of citrus will only be better when industries are established to use the raw orange seeds for production of juice and other consumables.

**Keywords:** Citrus, Citrus Farming, Assessment.

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## 1. INTRODUCTION

Citrus is generally believed to have originated from north eastern India (Davies and Albrigo, 1994). The commonly grown citrus species such as oranges, grapefruits, limes and pomelos belong to the family Rutaceae, with about 150 genera (Opeke, 2005), while the largest grown in Nigeria is oranges (Avav, 2015). According to Alva et al. (2001) global production of citrus is at 102 million metric tons per annum which far exceeds annual production values of other popular fruits such as banana, mango and apple. However, more recent estimates put annual citrus fruit production at 105 million metric tons (United Nations Conference on Trade and Development (UNCTAD), 2010; Wikipedia, 2010). There has been a steady rise in citrus production globally due mainly to increase in hectarage, consumer preference for more health or convenience food and rising incomes (UNCTAD, 2010). Although about 140 counties are known to be involved in citrus production (UNCTAD, 2010), Brazil and the United States alone are credited with contributing up to 45% of global orange production (FAO, 2004). Year 2007 estimate indicates that the top 10 citrus producing counties are Brazil, China, United States, Mexico, India, Spain, Iran, Italy, Nigeria and Turkey. It has been stated that citrus production in West Africa is on a small scale and unorganized (Opeke, 2005), the ranking of Nigeria on the 9th position among the world top 10 producers of the commodity signify that the situation might be changing. This is in consideration of the fact that previous statistics did not feature Nigeria or any of the West African countries (FAO, 1991). In any case, most of the citrus fruit produced in the country is consumed locally (Opeke, 2005) and does not seem to feature at all in international trade (UNCTAD, 2010). In Nigeria citrus production is more concentrated in the guinea and sudan savanna zones (Olaniyan, 2004), with Benue state giving the highest annual production of the commodity (Avav and Uza, 2002). Unfortunately, there have been little or no studies involving crucial role of the citrus farming on community development in Benue state. This explains why this study examines the impact of Citrus farming on socio economic status of the farmers in Vandeikya Local Government of Benue state.

### Objectives of the Study

The main objective of this research is to assess the socioeconomic importance of Citrus farming on farmers in Nigeria, and to find out the different problems and probable solutions of citrus farming in Nigeria.

## 2. METHODOLOGY

This paper was a perspective view on the socioeconomic importance Citrus farming on Farmers in Nigeria. As such, the only source of data used was the secondary data. This was collected from reports of Food and Agriculture Organization (FAO) United Nations Conference on Trade and Development (UNCTAD) and journal articles on Citrus farming in Nigeria. Content analysis was therefore employed in the analysis as it offered the researcher the opportunity to synthesized the ideas and situate them in the right perspectives for the purpose of arriving at valid conclusion.

### Overview of Citrus Farming in Nigeria

Orange is an important fruit in Nigeria. It is very rich in Vitamin C, folic acid and it is also as a good source of fiber. It also contains a host of other important nutrient element like foliate, thiamin, niacin, vitamin B6, phosphorus, magnesium and copper (Mba, 2018).

Citrus was introduced in Nigeria by the Federal Department of Agriculture and missionaries in the 1930s (Adigun, 1993). It spread throughout the country, and is rated as the most widely planted fruit tree in the country and many other tropical and subtropical regions (Meena, Geanger, Meena, Bhatnagar and Meena, 2017). The country is the 9th major citrus fruit producing country globally after Italy and the largest region in Africa (Food and Agriculture Organization (FAO), 2012).

In many parts of the world, citrus fruits particularly those of the class *Citrus sinensis* (sweet orange) have always remained part of human diet for many years. In recent times, however, they have assumed greater importance in diets of both urban and rural dwellers. The increased interest in their consumption is not only due to their sweet refreshing properties but also as a result of increased knowledge of their nutritional and medicinal values (Fakayode, Omotesho, Babatunde and Momoh, 2010). About 3.4 million metric tonnes of citrus fruits are produced in Nigeria annually from an estimated 3 million hectares of land (FAO, 2008). The country is the 9th major citrus fruit producing country globally, just after Italy and the largest growing region in Africa, followed by Egypt, Morocco and South Africa. Although Nigeria is not well noted for the exportation of citrus fruits, she has the potential to produce more for both local and international markets. Presently, the local processing of citrus fruits is on the increase to meet increasing local demands for fruit juice that was previously met by large-scale importation. Of all the citrus fruits, sweet orange is the commonest and the most widely cultivated and consumed in the major 16 states which grow citrus in Nigeria, namely; Benue, Cross River, Imo, Anambra, Osun, Ondo, Lagos, Ogun, Oyo, Kwara, Abia, Plateau, Kogi, Kaduna, Enugu and Bauchi states.

However, the farmers may face a number of other constraints which might cause difficulty in production of citrus fruits. The perishable nature of the citrus fruits results in high risks in the production. It implies that an efficient marketing strategy needs to be put in place to avoid damage to crops after they are harvested. Commercial cultivation of fruits, citrus inclusive, for large scale processing into various fruit products has not really started in Nigeria. There is also little investment in citrus processing in Nigeria, despite the fact that investment in the processing of fruits (citrus) has good economic returns. Some of the challenges of citrus production in Nigeria, particularly Benue state are difficulty in accessing formal credit due to bureaucratic bottle necks, lack of packing shed facilities, lack of appropriate storage facilities and transportation related problems (Abdulsalam, 2004). This scenario creates doubt in the ability of the citrus production to work efficiently to produce suitable incentives to meet consumers' needs, more accurately in terms of type, quality and quantity of supply. The capacity to process citrus fruits is largely missing in Benue state, Nigeria. Farmers harvest at the same time and the local markets are often glutted leading to high quantities of fruits spoilage (Abdulsalam, 2004). Inadequate agronomic and technological knowledge on production also contributes to haphazard nature of production. This eventually contributes to low yields and quality of citrus being produced.

Over 50% of the fruits produced in Nigeria are lost in transit between farms and major urban markets (Opeke, 2005). It is believed that such losses are avoidable and result from the farmers/middle men's preference to sell at higher price in the markets rather than selling to processors without taking into account the cost of wastage. There is a need for efforts to be geared towards increasing production and curtailing post-harvest losses through proper value addition, Establishment of cold storage facilities across the country would greatly help in reducing wastes that accrue during the harvest season.

### 3. SOCIO-ECONOMIC IMPORTANCE OF CITRUS IN NIGERIA

#### Major Products from Citrus

It has been established worldwide that about a third of citrus fruit production goes for processing, the rest being eaten fresh. Also the most important processed citrus product is orange juice, representing about 80% of the total citrus juice production. The proportion of grapefruit utilization for processing is similar to that of orange (Avav,2015).

In contrast, however, nearly all small citrus fruits of tangerine type are intended for consumption in the fresh market. Lemon and lime are somehow different since they are normally consumed in association with other food products.

In the citrus processing industry, the raw juice constituting about 50% of the processed fruit, the peel residue and the seeds are the major products or byproducts and from these sources a lot of industrial products are derivable. For example, single strength (natural) fruit juice (orange, lime/grapefruit, etc.), concentrated juice, citrus fruit powders and fruit (orange) flour are some of the major industrial products derived from the raw juice. Also, the pressed peel, citrus pulp and meal, peel oil, citric and lactic acids, brandy spirit, feed yeast, vinegar, marmalade, candied peel and citric pomade are products derivable from peel residue.

The level of sophistication of the citrus fruit utilization therefore depends on the technology available within the various citrus producing countries, and the dynamics of the cost of derivable products locally or internationally. Processed citrus products include; Orange juice products (freshly squeezed orange juice, orange juice production (single strength), orange squash and concentrated juice production), Dehydrated citrus product (fruit juice powder, low moisture orange granules and marmalade and jam), Citrus by-products (dried citrus pulp, citrus molasses, citrus peel oils, distilled citrus oil, flavonoids, citrus seed oils and pectin substances), and Fermented products (vinegar, feed yeast, citric and lactic acids).

#### Culinary Uses of Citrus

Many citrus fruits such as oranges, tangerines, grapefruits are generally eaten fresh. They are peeled and can be split into segments. Oranges and grapefruit juices are popular breakfast beverages, but more astringent citrus such as lemons and limes are used for garnishing or in cooked dishes. Their juices are used as ingredient in varieties of dishes, e.g. in salad dressing and squeezed over cooked meat, fish or vegetables. Citrus is an important fruit tree especially in the production of single strength fruit juices and concentrates. Citrus juice contributes about 26% of the dietary vitamin C requirement, 0.9% of total daily calories and 1.7% of the daily carbohydrate intake of an average man. After the extraction of the juice from the fruit, the resulting fruit pulp is a possible livestock feed and the rind acid (oil) is an expensive commodity in the international market. Citrus seeds are also known to contain sweetening agents, which are being studied as probable sugar substitute. The compound Naringin (a flavonoid) and neohesperidin dihydrochalcone from grapefruit and pummelo have application as artificial sweeteners. They are said to be 1000 times the sweetness of sugar and produce a long-lasting sweetness slow to develop, with an after taste like licorice or menthol. Citrus peels can be used for the production of citric acid, lactic acid, feed yeast and vinegar.

#### Medical Uses of Citrus

The leaves, flowers, peels, fruits and dried bark of citrus have important medicinal values. The dried bark of citrus is a raw material for the production of insecticides. Citrus has also found use in the pharmaceutical, cosmetic and soap industries. As a dietary supplement, citrus has been used to stimulate appetite, treat ringworm infection, relief stomach upset and aid insomnia. The fruit and peel are included in nasal decongestants and weight loss products. The unripe orange fruit and its rind are good in relieving insect stings, while the bark and root are antiseptic for the treatment of toothaches. Juices of the ripe fruits are good as appetizer, for healthy

teeth, bones and gums and known to promote healing of wounds and sores. Another medicinal use is in the area of easing inflammations due to skin bruises and muscle pains. Hesperidin is a bioflavonoid, found at doses up to 8% in dried citrus dry peel, is a strong vasopressor agent (reduce blood pressure). Citrus pectin is reported to reduce cholesterol by 30%, aortal plague by 85% and narrowing of coronary arteries by 88% in animal feeding studies. Other areas of medicinal application are in contraceptives, laxatives, purgatives, sedatives and treatment of wide ailments such as diarrhea, vomiting, cancer therapy drugs, etc.

### Citrus Production in Nigeria

In Nigeria, about 3,900,000 tonnes of citrus fruits were produced from an estimated hectareage of 800000 hectares of land in 2012 (FAO, 2014). Citrus is grown in the rainforest and guinea savannah, most of these farm-lands are in the remote part of the country. There are two main markets for citrus fruit in Nigeria: the fresh fruit market and the processed citrus fruits market (mainly orange juice).

Most citrus production is accounted for by oranges, but significant quantities of grape fruits, lemons and limes are also grown. Total production and consumption of citrus has grown strongly since the 1980's. The rise in citrus production is mainly due to the increase in cultivation areas, improvements in transportation and packaging, rising incomes and consumer preference for healthy foods (UNCTAD, 2008). Major citrus producing states in Nigeria include Benue, Nassarawa, Kogi, Ogun, Oyo, Osun, Ebonyi, Kaduna, Taraba, Ekiti, Imo, Kwara, Edo, and Delta.

### Demand and Supply Status of Citrus in Nigeria

Demand for citrus in Nigeria has grown rapidly over the past decade and this growth is expected to continue to rise. Compared to an estimated 15 million consumers of citrus fruit and juice in 2002, market size more than tripled to an estimated 55 million (approximately 37% of population) in 2007. Nigeria's demand for consumer-pack fruit juice was estimated at more than 200 million liters (over 90% of which was imported) prior to the ban on consumer pack fruit juice in 2002 by the Federal Government of Nigeria. Since the ban, consumption of fresh and processed citrus has further increased by approximately 10% per year. Fruit juice consumption has grown from 200 million liters in 2002 to 320 million liters in 2007. The market for fruit concentrate, Pre-mix and Syrup (concentrates) has thus risen from 1.5 million kg in 2002 to about 30 million kg in 2007 (GAIN Report, 2009).

This coupled with the increased knowledge on the health benefits of fruits and the demand by processors for fresh fruits is an indication of the weight of promise citrus offers Nigeria if its value chain is sufficiently developed.

### Problems of Citrus Production in Nigeria

**Funding:** The dwindling economy of the country has made it difficult for interested entrepreneurs to access loans and grants enough to enable them start an orange farm.

Unavailability of funds and lack of capital for prospective investors as well as funds for continuous management of the farm is one of the major problems affecting commercial orange farmers in Nigeria.

**Inadequate Government Support:** Lack of government support for orange farmers is also one of the major problems facing farmers, the government has not given enough assistance in terms of seedlings subsidy, motorable roads to areas with high concentration of orange farms. The government has also failed to produce storage facilities for farmers. Lack of adequate electricity has also affected processing industries, leading to the closure of many.

**Poor Road Network:** Inaccessibility of rural areas where large amount of the fruits are produced due to poor road network is also a serious problem for producers, the fruits are usually prone to spoilage due to the bad roads, and long hours of travel which is also caused by bad roads. This usually leads to grave losses for the farmers and buyers.

**Lack of Modern Cultural Practices:** Most orange farmers and intending farmers usually follow old and outdated cultural practices, most of which has been in use for more than 20 years.

Most orange farmers fail to make research or seek expert opinion and advice concerning the latest and most productive cultural practice applicable, thereby exposing their farms to low productivity and ultimately loss of investment.

**Pest and Diseases:** Another major problem affecting orange farmers in Nigeria is the issue of pest and disease infestation, premature fruit drop due to attack by nocturnal fruit piercing moths, termite damage to stem bark and tree roots and gummosis as well as death of budded seedlings.

This pest and disease of the orange crop can easily spread from one tree to the other if not tackled on time, and most times reduces productivity.

**Adverse weather condition:** During the long dry season in Nigeria, Orange crop suffers severe soil moisture stress and this leads to high seedling mortality and reduction in production size as even the matured trees are usually noted to wilt during very low supply of water.

### Review of Interventions towards Developing Citrus Value Chain in Nigeria

Nigeria produced 3% of total world citrus output between 2000 and 2004. This ranked the country ninth among the major producing countries of the different types of citrus fruits, thereby making it a major producer of citrus (UNCTAD, 2007). However, the production of citrus in Nigeria is mainly for local consumption. Area of citrus increased steadily at about 72000 hectares in 1999 from 30,000 hectares in 1961. Output of citrus increased steadily from 1000 tons in the 1960s to 3,250 tons in the early 2000. However, for many years, citrus output stagnated at the same level (Yusuf and Falusi, 2000).

The Federal Government of Nigeria over the years have set up Research Institutes, Universities and special facilitating agencies to increase, improve and sustain the pace of production, utilization and marketing of tropical fruits, citrus inclusive. These agencies/organizations over the years have increased the knowledge pool of the country, in areas of R&D, on production and utilization, in domestication of technology, and in fabrication of process equipment for tropical fruits. Agencies that have contributed to the development of tropical fruits in Nigeria include National Horticultural Research Institute (NIHORT), Ibadan; Federal Institute of Industrial Research, Oshodi (FIIRO); Nigerian Stored Products Research Institute (NSPRI), Ilorin; National Biotechnology Development Agency (NABDA), Abuja; National Centre for Agricultural Mechanization (NCAM), Ilorin; Tree Crop Development and Marketing Company (TRECDEM); Kano State Horticultural Institute and Raw Materials Research and Development Council (RMRDC), Abuja.

In 2002, the government of Nigeria placed an import ban on fruit juices in retail packs, fruit juice drinks, fresh and dried fruits. It was expected that the ban on the importation of these items will stimulate growth in citrus production. Fruit juice manufacturing companies have already taken advantage of the ban to establish orchards to feed their plants. Also, in order to promote increase in the production of tropical fruits like citrus, The Presidential Initiative on Tropical Fruits Production in Nigeria was launched in 2005. A National Implementation Committee was set up to find ways of achieving 10% of the world tropical fruits production within 4 years.

In line with its mandate, the Raw Materials Research and Development Council (RMRDC) has been involved in programmes and projects aimed at supporting and expediting industrial development and self-reliance through optimal utilization of local raw materials as inputs for industries. A number of projects have been executed towards improving the Citrus value chain by RMRDC. Under the Model Factory and Joint Venture Project, The Council established a Fruit Juice Processing Plant in Kaduna and later ceded it to a private company. The World Bank Step B Project provided a grant to RMRDC for development of the fruit juice industry in Nigeria. Other members of the project team include NABDA, FUMMAN and Niger Resources. The project upgraded tissue culture facilities at NABDA, NIHORT and NAGRAB. Planting materials of selected elite varieties of citrus and other fruits were produced distributed to farmers. Private sector organizations were encouraged to set machinery towards establishing Concentrate factories and plantations of fruits in order to decrease importation of concentrate. These were done through two stakeholders forums hosted by RMRDC in Lagos where most of the manufacturers were present (Jolaoso, 2011). The Council also conducted a Survey of Citrus as an Agro-Raw Material in Nigeria and a book titled "Citrus Production and Processing in Nigeria" was published by the Council (Jolaoso et. al., 2011)

#### 4. CONCLUSION AND RECOMMENDATIONS

Following a keen assessment of Citrus farming in Nigeria, this study concludes that citrus farming has a significant positive impact on the socio-economic status of the farmers in Vandeikya Local government. What is pertinent and needs urgent attention is how the challenges associated with poor infrastructure, adverse weather conditions, pest and diseases; and inadequate funding will be addressed to improve the lots of citrus farmers in the local government. To this end, this study recommends the following:

- (i) Provision of local infrastructure: Local and state governments should provide feeder roads to facilitate the evacuation of citrus from farms to the market.
- (ii) Establishment of Factories and industries: The value chain of citrus will only be better when industries are established to use the raw orange seeds for production of juice and other consumables.
- (iii) Subsidy on Citrus farm inputs: provision of subsidies on insecticides and pesticides will help farmers improve their socio-economic status.
- (iv) Provision of irrigation Facilities: The Vandeikya Climate is the type that stresses soil moisture after the rainy season. This often has negative effect on the life of the citrus trees. Irrigation Facilities will help strengthen the life of orange trees thereby improving productivity, harvest and income to the farmers.

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