



## Strategies for Enhancing Production of Citrus among Small-Scale Farmers in Benue State, Nigeria

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**Abstract:** The survey was conducted in Benue state, Nigeria to identify strategies for enhancing production of citrus among small-scale farmers. Data were collected from a sample of 120 respondents using questionnaire. Frequency, percentage and mean score were used for analyzing data for the study. Findings show the major sources of agricultural information to include friends/neighbours/relations (95.8%), mobile phones (74.2%), contact farmers (70.8%), extension agents (68.3%), bulletin/newsletter (67.5%), among others. Results also show strategies for enhancing production of citrus which include controlling post harvest losses ( $M=3.92$ ), provision of infrastructural facilities such as good roads ( $M=3.79$ ), timely provision of farm inputs ( $M=3.84$ ), establishment of processing industries ( $M=3.73$ ), provision of transport facilities ( $M=3.73$ ), provision of technologies for waste reduction ( $M=3.41$ ), adequate funding for research and development ( $M=3.10$ ), availability of organized markets ( $M=3.19$ ), provision of labour saving technologies ( $M=2.83$ ), reduction of market intermediaries ( $M=2.73$ ), among others. The study recommends among others the need for infrastructural facilities such as good roads, storage facilities, etc. to be provided by government at all levels in order for the citrus farmers to increase outputs and maximise profits.

**Keywords:** Citrus, production, small-scale, farmers, increase, Nigeria

### 1. INTRODUCTION

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 9<sup>th</sup> 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. 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 following research questions are pertinent to this study. What are the sources of agricultural information for production of citrus? And what are the strategies for enhancing production of citrus?

Specifically, the study sought to:

- i. identify sources of agricultural information; and
- ii. ascertain strategies for enhancing production of citrus.

## **2. METHODOLOGY**

The study was carried out in Benue state, Nigeria. Benue State is delineated into three agricultural zones, namely; Northern zone (A), Eastern zone (B) and Central zone (C). The state comprises (23) local government areas with Makurdi as the state capital. It is located between longitude 7° 47' and 10° 0' East and latitude 6° 25' and 8° 8' North. It shares boundaries with five other states namely; Nasarawa state to the north, Taraba state to the east, Cross-River state to the south, Enugu state to the south-west and Kogi state to the west. The state also shares a common boundary with the Republic of Cameroon on the south-east. Benue state occupies a landmass of 34,059 square kilometres. It has an estimated population of 4,253,641 (National Population Commission (NPC), 2006).

The state experiences two distinct seasons namely; the wet season and the dry season. The rainy season lasts from April to October with annual rainfall of 100-200mm. The dry season begins in November and ends in March. Benue State is blessed with abundant mineral resources such as limestone at Tse-Kucha near Gboko and Kaolinite at Otukpo. Other mineral deposits include baryte, gypsum, feldspar, wolframite, kaolinite, mineral salts and gemstone.

The state is inhabited predominantly by the Tiv, Idoma and Igede people. Farming is the major occupation of the people in the state, engaging more than 70% of the working population. This has made Benue the major source of food production in the nation. Major crops grown are rice, groundnut, cowpea, cassava, sweet potato, maize and sorghum. Tree crops grown include citrus, mango, oil palm, cashew and guava. Livestock raised include sheep, goat, pig, rabbit, poultry and cattle.

All citrus farmers in Benue State, Nigeria constituted the population of the study. There are three zones in Benue State, namely; Zone A, Zone B and Zone C. Zone A was selected out of the three zones as a result of producing large quantities of citrus. In the first stage, Ushongo and Vandekeiya LGAs were purposively selected in Zone A. In the second stage, five (5) council wards were purposively selected from each LGA. In each of the council wards selected, simple random sampling technique was used to select twelve (12) respondents, making a total of 120 respondents.

Questionnaire was used for collecting data for the study. The questionnaire was divided into two sections namely; A and B. Section A focused on sources of agricultural information for production of citrus while section B centred on strategies for enhancing production of citrus. Data for this study were analyzed using both descriptive and inferential statistics such as frequency, percentage and mean score.

### 3. RESULTS AND DISCUSSION

#### 3.1. Sources of Agricultural Information

Results in Table 1 reveal sources of agricultural information which are friends/neighbours/relations (95.8%), mobile phones (74.2%), contact farmers (70.8%), extension agents (68.3%), bulletin/newsletter (67.5%), opinion leaders (50.8%), posters/handbills (45.8%), internet (31.7%), radio (25.0%), television (10.8%) and magazine (7.5%). This implies that the respondents in the study area obtained agricultural information from interpersonal sources. This is in agreement with Leeuwis and Vandenban (2004) who stressed that interpersonal sources such as friends, family members and neighbours are the main providers of the agricultural information due to their credibility, reliability and most of all, they are trusted by the rural community. Gupta (2005) also reported that mobile phone facility has increased the opportunity of getting access to the people living in remote areas which contributes towards developing farmers' linkages with other people including extension experts.

**Table1.** Distribution of Respondents according to Sources of Agricultural Information on Citrus Production (n=120)

| Sources of information        | Frequency* | Percentage (%) |
|-------------------------------|------------|----------------|
| Radio                         | 30         | 25.0           |
| Extension agents              | 82         | 68.3           |
| Contact farmers               | 85         | 70.8           |
| Opinion leaders               | 61         | 50.8           |
| Friends/neighbours/relations  | 115        | 95.8           |
| Magazine                      | 9          | 7.5            |
| Television                    | 13         | 10.8           |
| Extension bulletin/newsletter | 81         | 67.5           |
| Posters/handbills             | 19         | 15.8           |
| Mobile phones                 | 89         | 74.2           |
| Internet                      | 38         | 31.7           |

\* Multiple responses

#### 3.2. Strategies for Enhancing Production of Citrus among Small-Scale Farmers

Table 2 indicates strategies for enhancing production of citrus which include controlling post harvest losses (M=3.92), provision of infrastructural facilities such as good roads (M=3.79), timely provision of farm inputs (M=3.84), establishment of processing industries (M=3.73), provision of transport facilities (M=3.73), provision of technologies for waste reduction (M=3.41), adequate funding for research and development (M=3.10), availability of organized markets (M=3.19), provision of labour saving technologies (M=2.83), reduction of market intermediaries (M=2.73), establishment of cold storage facilities (M=2.61), among others. This implies that the strategies if considered will go a long way in enhancing production of citrus in the study area. Bhat *et al.* (2015) also reported that citrus farmers are making efforts to improve production but efforts of the government at all levels are needed in providing enabling policies and programmes.

**Table2.** Strategies for Enhancing Citrus Production among Small-scale Farmers

| Strategies   | Mean Score | Standard deviation |
|--|------------|--------------------|
| Controlling post harvest losses                            | 3.92       | 0.44               |
| Provision of technologies for waste reduction              | 3.41       | 0.99               |
| Establishment of cold storage facilities                   | 2.61       | 1.27               |
| Adequate funding for research and development              | 3.10       | 0.82               |
| Establishment of processing industries                     | 3.73       | 0.67               |
| Establishment of orchards in rural areas                   | 1.87       | 1.35               |
| Availability of organized markets                          | 3.19       | 0.80               |
| Favourable government policies                             | 2.48       | 1.00               |
| Reduction of market intermediaries                         | 2.73       | 0.76               |
| Provision of transport facilities                          | 3.73       | 0.67               |
| Provision of infrastructural facilities such as good roads | 3.79       | 0.66               |
| Provision of labour saving technologies                    | 2.83       | 1.13               |
| Timely provision of farm inputs                            | 3.84       | 0.55               |

#### 4. CONCLUSION AND RECOMMENDATIONS

The respondents sourced information mostly from friends/neighbours/relations, mobile phones, contact farmers and extension agents. Major strategies for enhancing production of citrus which include controlling post harvest losses, provision of infrastructural facilities such as good roads, timely provision of farm inputs, establishment of processing industries, provision of transport facilities, provision of technologies for waste reduction, adequate funding for research and development, availability of organized markets, provision of labour saving technologies, among others.

Agricultural extension services delivery in Nigeria should be revamped through adequate funding in order to provide mobility, training, incentives and institutional support for extension agents so as to increase its services to citrus farmers for enhanced production.

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