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Kola production and utilization for economic development

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ABSTRACT: Kola is an important cash crop to a significant proportion of Nigerian population who are involved in kola farming, trading and industrial utilization. Research on the improvement of kola productivity and utilization is one of the major mandates of the Cocoa Research Institute of Nigeria (CRIN), where remarkable achievements have been made on kola. CRIN has developed improved *Cola nitida* hybrids with short maturation period of 5 years and an annual average yield of about 2000 nuts/tree/year. The kola pod husk has been used in the manufacture of poultry feeds, snail feed (KOLA-T), liquid detergent and organic fertilizer. Other products are the kola wine, kola soft drink and chocolate. All these products have been developed by CRIN and are waiting appropriate funding by the government or any investor who will buy the patent rights or go into collaborative venture with CRIN. This paper highlights these achievements and suggests strategies to enhance investment opportunities in kola which will transform into economic empowerment.

Key Words: Kolanut; *Cola nitida*; Cash crops; Economic development.

Introduction

The genus *Cola* of the family Sterculiaceae (Russel 1955) is indigenous to tropical Africa and has its centre of greatest diversity in West Africa. In the forest areas of West Africa, kola is perhaps second only to palm oil in importance in the list of indigenous cash crops. About 40 *Cola* species have been described in West Africa. However, in Nigeria, the *Cola* species of real importance are *C. acuminata* and *C. nitida* (Quarco, 1973; Daramola, 1978).

Cola acuminata and *Cola nitida* are important economic crops in the forest areas of West and Central Africa, Caribbean Islands, Mauritius, Sri Lanka and Malaysia (Eijnatten, 1969; Oladokun, 1982). The cultivation of *C. nitida* in Nigeria began sometime in the 19th century. The “goro nut” (*C. nitida*) was observed to be growing abundantly in the Otta bush in 1854 while its cultivation was noted in Egba Division in 1902 and in Labochi and environs in 1901. From Agege, *C. nitida* cultivation presumably spread to the forest areas following first the course of the railway line into Abeokuta, Ibadan and Offa, replacing the local *C. acuminata* and penetrating later along streams and river banks into the Guinea Savannah and, at present, South South and Eastern states (Eijnatten, 1969).

Kola is an important economic cash crop to a significant proportion of Nigerian population who are involved in kola farming, trading and industrial utilization. Nigeria accounts for about 70 percent of the total world production of kolanuts (Quarco, 1969, 1973; Jacob, 1973). While the demand is rising, the production remains low because many of the trees in Nigeria are unfruitful or have very low yield due to

self and cross incompatibility among trees, partial and total sterility, inefficient natural pollination, old age, field and storage pests and diseases (Odegbaro, 1973; Daramola, 1978; Jacob, 1971, 1973). About 90% of the kola produced in Nigeria is consumed within the country while 10% is exported (Quarco, 1973). The cultivation of kola in Nigeria is ecologically limited to the rain forest zones of the South and riverine areas of the Savannah region.

Kolanut has for hundreds of years served as an important article of internal trade in Nigeria and other parts of Africa (Nzekwu, 1961). It has been an item of trade in West Africa and in the Trans-Saharan trade routes for many centuries (Egbe and Sobamiwa, 1989).

Kolanut is used as a masticatory stimulant by Africans and has numerous uses in social, religious, ritual and ceremonial functions by the natives in the forest region of Africa. It is used during ceremonies related to marriage, child naming, installation of Chiefs, funeral and sacrifices made to the various gods of African mythology (Nzekwu, 1961; Daramola, 1978a; Opeke, 1982). There is also increasing demand for its usage in pharmaceutical industries and for production of soft drinks, wines and candles (Beattie, 1970; Ogotuga, 1975). Its uses have inevitably created a high demand in excess of its production (Oladokun, 1985).

Kola nut has been used as a base for a new brand of chocolate and wine (Kola chocolate and Kola wine) which were developed by CRIN researchers (Famuyiwa 1987). Eka (1971) has also reported the possible use of pulverized kola nuts for the preparation of hot non-alcoholic beverages. It could also be used in jam and jelly production because of its high pectin content. Furthermore, due to the high potassium content of the kola nut testa, it has been suggested as a possible ingredient for making fertilizers (Eka, 1971; Ayodele, 1988; Olubamiwa *et al.* 2002).

The kola pod husk has also been utilized for the production of liquid soap. The most recent and remarkable advancement in kola by-product utilization is the use of kola pod husk in the replacement of up to 60% of the maize used in poultry feed formulations (Yahaya *et al.*, 2001; Hamzat, 2001; Hamzat and Babatunde, 2001; Hamzat and Longe, 2002; Hamzat *et al.*, 2000; 2002a; 2002b; Olubamiwa *et al.*, 2002).

Other local uses of kola, according to Nzekwu (1961) are as follows: (1) it provides some essential materials for cloth dyeing; (2) the pod bark, when mixed with some ingredients, are used in traditional medicine to reduce labour pains; (3) the bark is used in treating swellings and fresh wounds; (4) the roots provide excellent chewing sticks for cleansing the teeth and the wood is used in local carvings, coach work and boat building.

Research on the improvement of productivity of kola is carried out at the Cocoa Research Institute of Nigeria (CRIN) with the mandate in Nigeria for research into production and extension aspects of cocoa, kola, coffee, cashew and tea. The main objective of this paper is to discuss strategies for enhancing investment opportunities in kola production and utilization for economic development.

Recent Advances in Kola Production and Products Utilization

Cocoa Research Institute of Nigeria (CRIN) has made the following advances in the area of kola production and utilization for the improvement of the Nigerian economy:

A. Kola Production

1. Promising hybrids of improved *Cola nitida* (kola) have been developed. These hybrids produce in five years with an annual average yield of about 2,000 nuts/tree/year marketable sizes (12 – 15g) compared with 250 nuts/tree/year of the unselected materials used by the farmers at present.
2. Vegetative propagation techniques for kola have been produced whereby rooted cuttings are produced which start to yield fruits three years after planting, compared to seven years gestation of the seedlings.
3. The on-shelf hand pollination technique has been used to identify/confirm sterility or incompatibility towards rehabilitation of old moribund farms and solving problems of sudden occurrence of unproductiveness in farmers orchards.
4. Additional high yield *C. nitida* and *C. acuminata* genotypes have been selected from farms.

5. Scarification technique has been established to facilitate rapid and uniform germination of kola nuts during seedling production.
6. Some alternative insecticides (Basudin 600 EC and Actellic 250 EC) have been found to be effective in protecting kola nuts to replace the hazardous use of Gammalin 20 EC and others hitherto prescribed.
7. Cultural methods have been developed and recommended for reducing economically important field and storage pests and diseases of kola trees and kola nuts. The cultural method involves (i) early harvesting of mature pods which greatly reduces the level of kola weevil damage, (ii) removal of fallen nuts, pods still on the tree at the end of the main fruiting season and unripe pods produced between crops, (iii) dehusking of pods far away from kola grooves and burying of pod husk which harbour developing larvae and also by careful removal of weevil infested nut before and during storage.
8. Edible salts and wood ashes have been successfully used to protect fresh and stored kola nuts from fungal diseases.

B. Kola Utilization

1. **Liquid Detergent:** The kola pod ash-based liquid detergent is a proven product that has attracted wide patronage. Large quantities were produced on contract during the Directorate for Food and Rural Infrastructure (DFFRI) during the military regime in Nigeria. Later, the Ministry of Defence also entered into a contract with CRIN for production in large quantities. The liquid detergent, which foams very well, continues to attract attention at Trade Fairs, Exhibitions, etc. It is a valuable product in the kitchen for washing utensils, and few drops of it are needed for cleansing.
2. **Organic Fertilizer:** The kola-pod husk-based organic fertilizer has been proven on our experimental station. It is simple and will be easily understood by our peasant farmers who operate at small- and medium-scale levels. According to Olubamiwa (2002), this product will be of advantage in kola-producing areas in view of present procurement logistic problems of inorganic fertilizers, worldwide demand for organic fertilizer and the low organic matter content in our soils.
3. **Layers Mash:** The use of kola-pod husk in layers mash was first tested by CRIN in 1998. It was a novel trial, being the first of its kind in the world. The result was rather interesting; KPH suitably and economically replaced 60% of the maize in a conventional layers mash. It was concluded that there is need to test the reproducibility of the result. This was confirmed on-farm at a poultry farm in Imota, Lagos State. In the later trial, 10 and 15 percent dietary inclusions of KPH reduced feed cost while not sacrificing bird performance (Olubamiwa *et al.* 2002). Plans are also in the pipeline to run a demonstration project site jointly by CRIN and Centre for Rural Development (CERUD), Lagos.
4. **Kola Testa for Snail Feed:** Trials by CRIN have shown that sole or partial feeding of kola testa (KOLA-T) to snails under a kola plantation is a worthwhile, commercially viable, venture. Raising snails under kola plantation will ensure sustainability of kola production because the kola farmer ploughs waste into snails in a sustainable fashion. It will also ensure soil enrichment through excreta of the snails cohabiting in the plantation and additional income for the farmer who may not need to wait till the kola harvest season before he can earn an income from his plantation. Feeding KOLA-T solely to snails was found to be better than other common snail feedstuffs. A joint demonstration plot by CRIN and CERUD is already in the pipeline.
5. **Kola Wine:** The recipe for Kola wine has been perfected by Ogutuga (1975). CRIN recently evolved another recipe which is highly relished by a cross-section of those who have patronised it. The cost of production is about half the market price of this wine (Olubamiwa *et al.* 2002).

6. Kola Chocolate: Chocolate has its basal material as cocoa bean flour. An adaptation of the cocoa bean flour-based chocolate at CRIN has produced kola chocolate with a distinct kola taste and aroma. The product has been under laboratory-scale production at CRIN for several years. The major constraint to commercial production is the acquisition of the needed equipment which are rather expensive. CRIN is presently in the process of fabricating the machines locally (Olubamiwa *et al.* 2002).
7. Kola Soft Drink: Members of a randomly chosen taste panel were not able to distinguish any difference between this product (CRIN-KOLA) and similar soft drinks such as Coca-Cola and Pepsi Cola.

Strategies for enhancing investment opportunities in kola production and utilization

1. The first step is to improve the quality and quantity of kola nut production in the country. This can be achieved by two approaches:
 - (a) Rehabilitation of kola orchards: It is known that about 50% of the existing kola trees yield insignificant produce. There is therefore a large wastage of land in the kola industry, especially in the western states. A more efficient utilization of land can be achieved by the cutting down of unproductive trees and replacing them with proven materials. Alternatively, old kola trees can be regenerated by coppicing at 30 – 60 cm ground level. The cut surface is immediately coated with red paint. No shade tree is planted near the coppiced trees. The coppiced stumps start forming outgrowths or swellings from 2 to 3 weeks after coppicing. At about 3 months, buds start to sprout from the swellings and these develop into young shoots. Usually, many shoots develop on the stumps and the abundance of young growth attracts many insects but the shoots are partly protected by regular spraying of insecticide (Dimethoate). Coppicing should be done around July or December and the maximum percentage regeneration is reached between 9 and 12 months after coppicing.
 - (b) New planting and suitable soils for kola: It is known that kola grows well in soils that are suitable for cocoa, coffee and in soils which are marginal to these two crops and several other tree crops. Soils of inferior moisture retention and nutrient properties which cannot sustain cocoa or coffee can be utilized for kola production, provided that they are deep and well drained. A shallow soil on decomposing rocks, deep soil profiles with a hard pan, areas liable to flooding or waterlogged clayed soils are all unsuitable for kola. There is an abundance of soils of high, medium and low fertility that can be strategically exploited for kola cultivation in an effective land utilization policy in Nigeria. Such suitable soils have long been identified in the following parts of the country: (1) South-western states, (2) Edo State (most of the southern part), (3) Delta State (most of the non-riverine areas), (4) South-eastern states, (5) Cross River State (most parts of the state), (6) Akwa Ibom State (most parts of the state), (7) Rivers State (the non-riverine areas), (8) Kwara State (Ilorin area), (9) Kaduna State (Zaria area), (10) Adamawa State (the southern parts of the state), (11) Kano State (areas around rivers and streams if irrigation is provided, especially during establishment stages), (12) Niger State (Mokwa and large areas of the upper part of River Niger, provided irrigation is available), (13) Benue/Plateau/Kogi States (Oturkpo and Kabba areas), (14) Nassarawa State (Lafia area) (FDA, 1973; Opeke, 1982). These suitable soils scattered all over the country should be utilized for new plantings of improved kola seedlings to ensure high production of kola nuts for export, leaving behind large quantities of wastes which will be utilized effectively to accomplish any of the recent advancements in kola utilization.
2. The government should invest directly in any of the recent advances in kola production and by-product utilization by going into a collaborative venture with CRIN or buying the patent rights of these products. Alternatively, the government should empower the kola farmers through the Kola Association of Nigeria (KOLAN) by providing short-term credit facilities and the establishment of demonstration sites for the utilization of kola and its by-products. The Federal Government

should also provide infrastructures and support services (good roads, health services, water, electricity etc.) in the agrarian communities so as to prevent rural-urban migration which makes it impossible to recruit skilled labour that will live and work in kola plantations.

3. It is now common knowledge that enormous opportunities abound in kola business. Kola production and by-products utilization has been generating a lot of interest in recent times. The Central Bank of Nigeria (CBN), in a recent memorandum, presented to the National Council on Agriculture and Rural Development recommended that kola nut should be listed among the industrial crops currently being developed by the Federal Government. With this development, kola has been granted the status of a cash crop being promoted for export by the Nigeria Export Promotion Council (NEPC) just like cocoa, coffee, cashew, palm kernel, palm oil etc that enjoy favourable prices in international markets. The Federal Ministry of Commerce (FMC), Raw Materials Research and Development Council (RMRDC) and Nigerian Export Promotion Council (NEPC) are all seriously involved now in kola development and utilization. However, the Federal Government should not further delay the necessary legislations on the cash crop status of kola so that the enormous potentials of this crop can be tapped fully for the economic empowerment of the nation. The Federal Government should liaise with CRIN and the kola producing states through the State Department of Produce Services, Ministry of Agriculture and expedite action on the grading of kola nut. This will serve as a good source of revenue for the government.
4. Kola nuts are best known outside Africa as an ingredient for cola beverages. Commercially produced cola drinks were developed in the late 1800s when chemists and inventors used kola nuts (as well as other exotic ingredients) in various drinks and tonics. Coca-Cola, the most famous beverage in the world, was invented from kola in 1886 by an Atlanta druggist, Dr. John Smith Pemberton and marketed as a “brain and nerve tonic” (Prevention’s Healthy Ideas, 2002). Unfortunately, due to political and economic reasons, it is speculated that Coca-Cola now uses synthetic kola flavours in place of the natural kola flavour. Plans are underway by CRIN to get Coca-Cola International to revisit the issue of abandonment of natural kola flavour for the production of kola beverages.

Conclusion

The Federal Government should, as a matter of urgent public attention, intensify efforts to create awareness on kola and its by-product utilization. This they can do by organising seminars and demonstration farms where experts from CRIN and other stakeholders will be on hand to keep the people informed about opportunities in kola propagation.

The government should also encourage all the kola farmers to participate actively in the activities of Kola Producers Association of Nigeria (KOLAN), and should sponsor their programmes from time to time. This will enable them continue the good works they are doing. The government should try to arrest rural-urban drift by providing the necessary incentives and infrastructures for the kola producing communities. It is only when this is done that the non-oil revenue of the country can receive a big boost.

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