

## **Socio-Economic Implications of Charcoal Production and Marketing in Nigeria**

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**Abstract:** Charcoal has been an important domestic product for many years and, and has wide market acceptance. Charcoal constitutes the primary urban fuel in most of Africa and some developed countries and is a major source of income. The production, transport and combustion of charcoal constitute a critical energy and economic cycle in the economies of many developing nations. The objective of this paper is to discuss charcoal production and marketing in relation to place (distribution) and price in Nigeria. Charcoal marketing and cost-benefit analysis depends on a study of commercial possibilities as indicated by source and cost of raw material, availability and cost of labor, price, distribution and the market for the charcoal produced. Some known charcoal deports are found in places like Oyo, Isheyin, Saki Igbo-Ora, Ogbomoso- all in the western part of the country. We also have depots in Jebba, Omu Aran, Egbe, Kabba in the Central States. Charcoal is found in abundance also in Minna, Jos and Kaduna. Charcoal marketing and distribution is a sequence of business activities that involves the producer, supplier, wholesaler or retailer, and the consumer. Charcoal for export is graded and packaged to meet the international standard specification of hardwood charcoal. A large market exists in EU, USA and ASIA with prices ranging from £170 to £190 per ton depending on mode of packaging. A container load which contains about 23 tons of bulk charcoal cost between N450, 000 to N500,000 to process and be made ready for export. Charcoal production is one of the primary causes of deforestation leading to land degradation in areas involved in the business. The business is associated with the felling of both mature and nearly-mature trees. Deforestation is a serious problem leading to global warming, therefore, the business World must wake up to, especially to mitigate the effect of global climatic change.

**Key words:** Charcoal, Hardwood, Pyrolysis, Marketing, Production, Distribution

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### **I. Introduction**

According to Anozie *et al.*, (2006) the cry for alternative energy sources due to the effects of global warming has put charcoal in the forefront of the global market. A large market exists in Europe and Asia with prices ranging from \$170 to \$300 per MT depending on the mode of packaging. The charcoal production industry is a multi-billion dollar industry and a money spinner for savvy investors to position themselves. Nigeria has comparative advantage in the production and export of hardwood charcoal in Africa over her counterparts due to the large arable land available and the conducive climatic condition for the production of hardwoods. Charcoal is mainly produced from tropical hard wood, although there are other sources like coconut shell. The process of production is called *Pyrolysis*. That is “burning of wood under high temperature in the absence of air” (ARBT, 2006)

Awoyemi *et al.*, (2006) maintained that this product is virtually available all over Nigeria as many local communities have perfected the technology of charcoal production. Some known charcoal deports are found in places like Oyo, Isheyin, Saki Igbo-Ora, Ogbomoso- all in the western part of the country. We also have depots in Jebba, Omu Aran, Egbe, Kabba in the Central States. Charcoal is found in abundance also in Minna, Jos and Kaduna.

William and Pinto (2008) pointed out that the business of trading in charcoal has now become a very lucrative venture in Nigeria. The charcoal trading business is a lucrative one for anyone involved in it, whether as a retailer, wholesaler or supplier. Charcoal is used as fuel in cooking, barbeque and heating and casting bronze and other metals. Charcoal is also being made use of by food sellers and caterers who cook for large gatherings as well as some households, who use it as an alternative source of energy owing to its cheapness. Hard wood charcoal can be produced year round. However it generally advised that charcoal production and export should be done during the dry season (from November to May). Production and export of charcoal during the raining season could be rejected by buyers because of the high moisture content (more than 10%) that usually characterized the charcoal produced during this period. Charcoal, because of it uses, is a seasonal product in some clime while in others they require it all year round. In Europe, the sales season starts from May to August because this is their summer time. The Europeans starts giving order from September to May. Though some big time importers in Europe buy all year round. In countries like Kuwait, Israel and some other Asia

countries, it is all year round and orders are placed from January to December (Nash and Luttrell 2007). This paper discusses the production and marketing of charcoal in relation to place (distribution) and price in Nigeria.

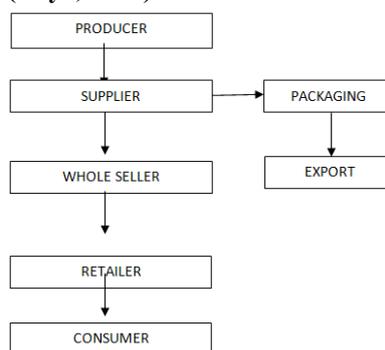
## **II. Charcoal Marketing and Distribution**

The charcoal distributions system links the charcoal supplier and the consumer, because like every other product; charcoal is of little use to the consumer, if it is not available at the right price, right place and time especially during scarcity, of Petroleum products. Charcoal consumer's uses the product as a source of energy for both domestic and commercial food preparation as well as cottage industries through the identified distribution system (KALU and IZEKOR 2007). Brew-Hammond (2006), pointed out that anyone can engage in charcoal marketing, either as a retailer selling from his shop, a wholesaler selling in large bags, or as a supplier selling truckloads of charcoals to other wholesalers. According to Oladosu and Adegbulugbe, (2005), a wholesaler or retailer can make between four hundred and fifty naira to six-hundred naira and more from the sale of a bag of charcoal, which goes for about one-thousand six-hundred naira in the market. The charcoal is usually source from the western part of Nigeria, and the discounts you get from the suppliers usually depend on the quantity you order from them. One very good thing about this business is that supply of charcoal does not take time to be delivered to the seller (unlike the supply of some other commodities) Dayo et al., (2004).

Dayo (2007) observed that charcoal business has a seasonal market, but the season differs from one country to another. For instances in Belgium, UK, Holland, France, Germany and Denmark, the Sales season is from May through August because that is their summer time. The Europeans give out their orders from September to May of the following year. In countries like Kuwait, Israel and other Asian countries, it is all-year round and order is placed from January through December. However, there are some big time importers in Europe who also order all year round (FAOSTAT, 2006).

Charcoal though been an old source of energy is as well still a modern source of energy for Cooking in both rural and urban areas. Kammen and Lew (2005) reported that half of the world's population use biomass fuels for cooking and that in 1992, 24 million tonnes of charcoal were consumed worldwide, with developing countries accounting for nearly all consumption while Africa alone accounted for 50%. Bhattari (1998) has documented the extensive use of Charcoal in Southeast Asia involving 16 countries, including India, Phillipines, Indonesia, Nepal, Pakistan and Myanmar. In Nigeria, studies in Benin city, show the main uses of Charcoal to be for cooking, Roasting (of Suya- Barbecue, Maize, Plantain, cocoyam and yam), blacksmithing and Bronze casting (Izekor and Kalu 2007). Charcoal in addition, is now an export commodity in Nigeria, with a large market in the EU, USA and Asia. The prices range from \$170 - \$300/ton. Tropical Africa accounts for 70% of the exports and the market is all year round with a slight drop between July and September (Essiet 2009, The Thy consulting 2011).

### **Flowchart of Charcoal Distribution (Dayo, 2007)**



Charcoal marketing and distribution is a sequence of business activities that involves the producer, supplier, wholesaler or retailer, and the consumer. Charcoal for export is graded and packaged to meet the international standard specification of hardwood charcoal given as:

Ash content: 3%-4%max, Volatile matter: 5-10% max, Wood matter: 2-4% max, Size: 20-120mm, Carbon: 65%-80%, and Moisture content: 8% max (FAO, 2006).

According to Dayo (2003), most often, the quality of the wood used in the production of the charcoal will determine how well the charcoal will burn. The weight of the charcoal is also a determinant of its quality. Quite often, good charcoals are usually heavy, while the bad ones are likely to be very light. People also prefer grinded charcoal, although this is more expensive.

In a study conducted by Gamtessa (2003), he pointed out that hardwood charcoal from Nigeria are exported to the following countries; Germany, Belgium, Greece, Poland, Spain, Bulgaria, Netherlands, Italy, UK.

### **Packaging and Price of Charcoal**

The cry for alternative energy source has put *Charcoal* in the forefront in the global market. A large market exists in EU, USA and ASIA with prices ranging from £170 to £190 per ton (Dayo, 2007), depending on mode of packaging. The United Kingdom alone consumes more than 60,000 metric tons of charcoal annually, out of which about 70% comes from tropical Africa. Other countries around the world equally consume charcoal in great quantity. Packaging of charcoal is usually done to the specification of the buyer. Some want bulk packaging, in which case, the charcoal is tipped into open high cube containers while others prefer packaging into finished packs like 3kg, 5kg, 10kg and 15kg. In terms of charcoal made for export, shipping is done through a reputable forwarding company and Terms of Trade can either be by letter of credit or Cash Against Document. Specifically, the price of charcoal (bulk delivery) is between £170 to £190 per ton (Dayo, 2012). Smaller packs in paper and carton cost between £165 to £170 per ton. A container load which contains about 23 tons of bulk charcoal cost between N450, 000 to N500, 000 to process and be made ready for export.



Packaged Charcoal for Export (Dayo *et al.*, 2007)

### **Production of Hardwood charcoal**

According to Karekezi and Majoro, (2002) hardwood charcoal are produced abundantly in Nigeria during dry season (from October to early June of each year) in; Oyo, Ogun, Ondo, Ekiti, Osun, Enugu, Rivers, Cross river, Kwara, Kogi, Abuja and Benue States. Good stocks for hardwood charcoal contain considerable low moisture contents, low ash contents and very minimum volatile matter contents. Another good quality of hardwood charcoal is to be in good sizes usually between 20-120mm and relatively high carbon contents to suit any usage (NNPC, 2007). The most important primary information needed to check before buying charcoal includes:

Constituents	Percentage
Moisture contents	8%max
Volatile matter	5-10% max
Ash contents	4%max
Wood matter	2-4%
Charcoal Size	20-120mm
Colour	Black or Dark grey
Carbon contents	70% min
Packaging Bulk,	30kg PP Bags (World Bank, 2003)

### **Methods of making Charcoal**

There are two methods of making charcoal (direct and indirect); the direct method uses heat from incomplete combustion of the organic matter, which is to become charcoal. The rate of combustion is controlled by regulating the amount of oxygen allowed into the burn and is stopped by excluding oxygen before the charcoal itself begins to burn; the indirect method uses an external heat source to “cook” organic matter contained in a closed but vented airless chamber (retort). This is usually carried out in a metal or masonry chamber (furnace) (Dayo, 2001).

### **Charcoal Processing and Returns on Investment**

850 bags will full a 40 feet container (850 bags), N20 per bag is usually charged as processing fee. Loading the charcoal into the container will cost N8,000 per container, local Government tax, and Association due at cost N5,000 per container. Total cost of the filled 23 Tones of charcoal delivered to the port equal to N626, 000 (Dayo, 2007).

Currently the foreign buyers buy at 170 Euros,

Therefore 170 Euros x 23 Tones at N195 per Euro.

The total will equal to  $170 \times 23 \times 195 = \text{N}762, 450$

To get the profit:  $\text{N}762, 450 - \text{N}626, 000 = \text{N}136, 450$

(N136, 450) Profit from a Container)

An exporter should be able to exports 4 containers in a month which is  $\text{N}136, 450 \times 4 = \text{N}545, 800$  Profit in a month (Dayo, 2007).

### **Socio-economic Implications of Charcoal Production**

In a recent studies conducted by Ajadi et al., (2012), they found out that charcoal enterprise is on part-time basis, undertaken as a coping strategy, and the forest is depleting due to uncontrolled and indiscriminate exploitation of mature and nearly-mature trees. On the other hand KALU and IZEKOR (2007) maintained that Charcoal enterprise is adopted to meet some socio-economic benefits and energy needs of the people. Therefore, its production would not stop because available alternatives are limited and expensive.

Charcoal export began in Nigeria in 1904 (Light and Sound, 2009). In 2000, about 67,767,000 cubic metres (2.4 billion cubic feet) of round wood were produced, 85 % for fuel. In the same year, Nigeria's consumption of fuel wood and charcoal was the third highest in Africa (Olori, 2009). About 70% of Nigerian population live in the rural areas and are directly or indirectly dependent on forest resources– especially wood – to meet both domestic and economic energy needs.

The production of Charcoal is one of the activities leading to destruction of forest cover in Nigeria, a situation aggravated by illegal commercial logging (Olori 2009). FAO (2005) indicates that between 1990 and 2005, Nigeria lost 35.7% of its forest cover and only 12.2% of the country's land is currently forested while 350,000 hectares of land in the country are lost to desertification annually. Problems posed by the production of charcoal are numerous. Adeniyi (1995) and Wikipedia Encyclopedia (2005) pointed out that Charcoal production is associated with felling of both mature and nearly-mature trees in almost all the areas involved in this business. Mitchell, (2009) maintained that deforestation is a problem, the importance of which the business world must wake up to, especially, to mitigate the effect of global climatic change.

Charcoal production at sub-industrial and industrial levels is one of the primary causes of deforestation and has been blamed for the problems of certain areas like the Democratic republic of Congo and Zambia (Wikipedia 2011). Land Degradation is another well known problem resulting from deforestation activities for whatever purpose including charcoal production. Smoke is a major pollutant. Wood smoke a product of Charcoal production contains Particulates such as PM10 (10 microns diameter or less) made of Creosate, soot and ash, which are efficient vehicles for transporting some viruses and bacteria to the lungs and blood stream. It also contains polycyclic aromatic hydrocarbons (PAH) particularly polynuclear organic material (POM) which is 50% contributed by residential wood burning. Dioxins especially Carbon monoxide (CO) is produced in burning without oxygen as don in Charcoal production. Other constituents include Nitrogen, Sulphur dioxide and volatile organic substances (VOCs) that represent risk to exposed persons (NESCAUM, 2006, Anon 2011).

### **III. Conclusion**

Charcoal constitutes the primary urban fuel in most of Africa and some developed countries and is a major source of income. The production, transport and combustion of charcoal constitute a critical energy and economic cycle in the economies of many developing nations. The marketing methods used are generally the same among the different States.

Although charcoal market is served from a number of competitive countries, exports from Nigeria, and other African countries are highly ranked because of the hard nature of the charcoal. European importers prefer charcoal produced from hardwood in Africa which is heavy and strong. Competitors are Malaysia, Indonesia, Brazil and Thailand. The quality of charcoal depends on the wood species. Despite excellent overall demand, the prospects for reasonable returns from a given operation depend largely on operational conditions and markets available to the producer.

Charcoal production is one of the primary causes of deforestation leading to land degradation in areas involved in the business. The business is associated with the felling of both mature and nearly-mature trees. Deforestation is a serious problem leading to global warming, therefore, the business World must wake up to, especially to mitigate the effect of global climatic change.

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