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## THE STATUS OF COCOA PROCESSING INDUSTRY IN WESTERN NIGERIA

<sup>1</sup>Mogaji K.O. and<sup>2</sup>Durotoluwa O.A.

<sup>1</sup>Department of Agricultural and Bio-Environmental Engineering, Rufus Giwa  
Polytechnic PMB 1019 Owo, Ondo State Nigeria

<sup>2</sup>Department of Mechanical Engineering, Rufus Giwa Polytechnic PMB 1019 Owo,  
Ondo State Nigeria

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### ABSTRACT

A survey carried out using personal contact and questionnaires in order to assess the status of cocoa processing industries in western Nigeria. During the survey some industries who involved in cocoa processing were identified. While, some of them are involved in the production of primary cocoa products such as cocoa liquor, butter, cake and powder, others are involved in production of secondary cocoa products such as beverages, chocolate, cosmetics and pharmaceutical products. Large, medium and small scale industries were also identified during the survey. Out of fifty questionnaires sent out only seven were returned. Descriptive statistical tools were used for the analysis. It was noted from the survey that the large scale cocoa processing industries available in Nigeria are well equipped with imported machineries. The industries are well staff with both administrative and technical staff. The present production level of cocoa liquor, cocoa butter, cocoa cake, cocoa powder and beverages range between 5.0 – 30.2, 5.0 – 12.7, 0.0-14.7, 0.0-11.4, and 2.4-8.1 ton/day respectively. It is strongly recommended that the government should encourage the local cocoa processing industries in Nigeria through favourable policies. The technical staff should also be challenged and trained to develop indigenous machineries before the imported machineries expire their serviceable life.

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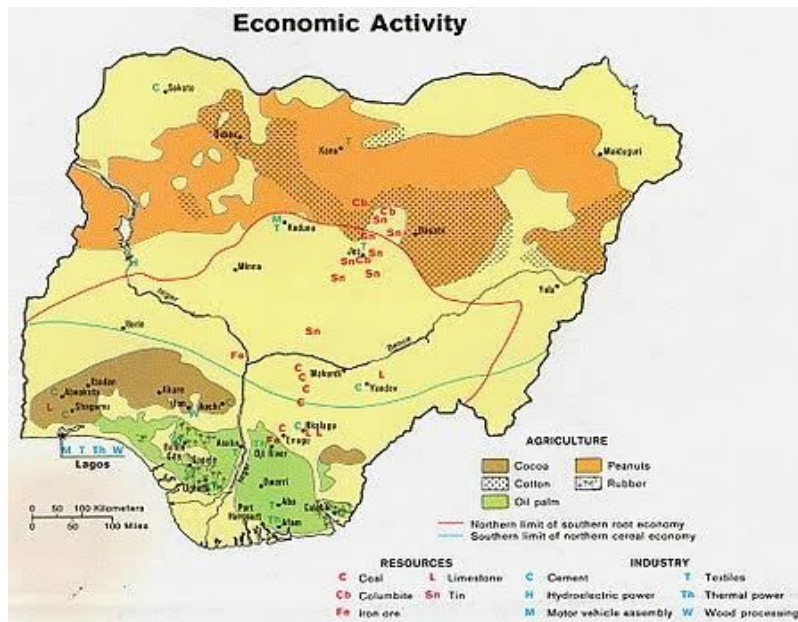
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### INTRODUCTION

The botanical name of cocoa is *Theobroma Cacao*, the word *Theobroma Cacao* means "food of the gods" as this was eaten only by the "upper class" (Wood and Lass, 1980). The word *cacao* in modern usage refer to the tree while, the word *cocoa* refers to a drink made from its seeds. The word *cocoa* and *chocolate* arose from the Mayan and Aztec language. The Mayan and Aztec were recorded as the first to use cocoa (Opeke,

1987). The crop was discovered by Christopher Columbus during his fourth voyage to the new world, he intercepted a canoe loaded with agricultural products including cacao, off the coast of Yucatan and took a sample to Spain. The specific centre of origin of cacao has been accepted as the area from the forests of the Amazon to Orinoco and Tobago in Southern Mexico. Wealthy Spaniards took kindly to cocoa drinks and the habit of drinking cocoa spread rapidly to Italy, France, Germany, Netherland and later to other parts of Europe. To sustain an interest in cocoa drinks and to obtain regular supplies of cacao beans at low prices from its colonies, Spain introduce cacao to Africa. In West Africa cocoa is essentially a smallholder crop: cultivated on 1.2 million to 1.5 million farms ranging in size from 1.2 to 2.8 hectares and employing about 10 million people (Padi and Owusu, 2008). The relevance of cocoa to most developing economies cannot be overemphasized as cocoa is produced by more than fifty developing countries across Asia, Africa, and Latin America, all of which are in the tropical or subtropical areas (Ogunleye and Oladeji, 2007).

Cacao was introduced into Nigeria from Fernando Po by Chief Squires Ibanningo in 1874 at approximately the same time that Teteh Quash introduced the crop in Ghana (Opeke, 1987). Other sources of introduction of the crop to West Africa include trading companies, Christian missionaries, soldiers, chiefs, farmer's association, cooperatives and various department of agriculture. The more recent introducers of cacao to West Africa as identified by Opeke, 1987 include the West African Cocoa Research Institute (WACN), Research Institute of Ghana (CRIG), Cocoa Research Institute of Nigeria (CRIN) and the Institute Francaise du Caca et du Café (IFCC). Since the discovery of crude oil in Nigeria in the late sixties, there has been a drastic shift from agriculture which was the main hub of Nigeria economy to crude oil production. Cocoa is the main agricultural subsector which contributes immensely to Nigeria's GDP, it also contributes about 15 % to the total Nigerian export in 1970 (Adebile and Amusan, 2011). It has grown to be a major export crop, accounting for about 37.9 % of agricultural export in 1997 (Oduwole, 2000).



**Plate 1: Map of Nigeria showing cocoa producing States**

Cocoa is mostly grown in fourteen of the thirty six Nigerian States. The main states are located in the South Western part of the country as shown in Plate 1 above (apart from Cross River, in the South East), which is the highest cocoa producing region 80 % with most production areas located in Ekiti, Ogun, Ondo, Osun and Edo (FAO, 2013). Cocoa is an important source of raw materials for industries, as well as source of revenue to government of cocoa producing States (Olowolaju, 2014). Currently, Nigeria is the fourth largest producer after *Cote D'ivoire*, Ghana, and Indonesia contributing 12 % of total world production (ICO, 2014). The South West is regarded as the cocoa belt of the country, it accounts for 70 % of Nigeria's annual cocoa production (Michael and Nzeka, 2011). Cocoa farmers worldwide depend on cocoa for their livelihood, with an annual world production of three million tonnes (WCF, 2000). Cocoa is the main agricultural export in Nigeria though its production accounts for only 0.3 % of the agricultural GDP (ICO, 2014).

### Uses and Economic Importance of Cacao

Almost all the parts of the crops is useful, the bean is used in the manufacture of drinks, chocolates, cocoa powder and cocoa butter. It is used in the production of cosmetic and pharmaceutical products. The pod, husk, pulp and sweetings are equally very useful. The juice and sweetings extracted from the crop could be used for the production of

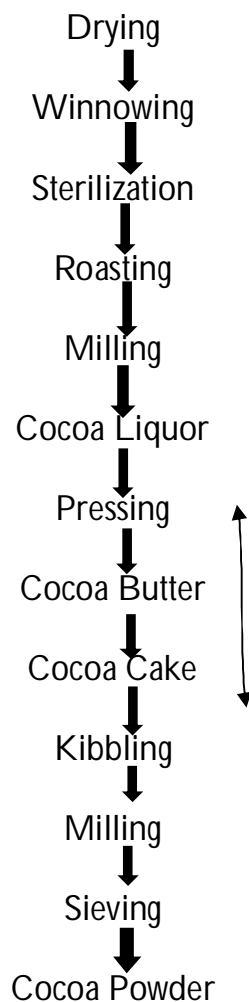
wine and alcohol. The drinks husk and hull have a high calorific value and are good sources of fuel. They are equally good thermal insulator. They could equally be a raw material for the production of particle board used in the construction industry. The Cocoa Pod Husk (CPH) are used as feed ingredients for poultry, pig, sheep, goat, cattle and fish (Adewumi, 1997). The CPH are palatable and consumed in large quantity by animals. The CPH is a good source of potassium and is used in the manufacture of potash fertilizer. It is also used for biogas and soap production (Adewumi, 1997). The economic importance of cocoa beans are many. It is a source of income to farmer, thereby help him raise his standard of living over the years. It is a source of foreign exchange for the government to financing some capital project. It is also a source of raw material to our local cocoa processing industry thereby creating job opportunities to various specialist. It act as source of food taken for pleasure with high nutritive value.

### **Production of Cocoa Liquor, Butter, Cake and Powder**

Whether cocoa liquor, butter, cake and powder are to be the end product, the manufacturing processes in the initial stages are the same. The quality of beans depends on the care with which the beans were fermented, dried and sometimes stored. Next, the beans are fed into a machine which both sorts them into sizes and cleans those using mechanical sieves and electromagnetic separators to remove foreign bodies. After this process, the beans are roasted in revolving drums. Roasting is a most delicate operation requiring experience and judgement because the flavour and aroma of the cocoa are influence by roasting (Are and Gwynne-Jones, 1994). The operator in charge can determine the degree of roast by colour, smell and touch.

The roasted beans are very brittle and this facilitates the next process, crushing. In the crushing machine, the beans are broken into small pieces and the pieces of the thin outer shell are winnowed away by blast of air, ready to be made into fertilizer. The broken pieces of beans are called nibs. They are ready for grinding using grinding machine. In this machine, the heat generated by the process causes the cocoa butter in the nibs to melt so that a thick paste (cocoa mass) rich in cocoa butter comes out of the machine. The cocoa mass is placed into a filter pressing machine which exerts pressure to remove most of the butter. The cocoa butter is a very useful substance because it melt at blood heat. It is therefore, supplied to the manufacturers of confectionary, toilet

preparations and pharmaceuticals for use in their products. After the excess cocoa butter has been pressed out leaving about 18 %, the mass is changed to hard round cakes. These are fed into another grinding machine after which the powder produced is passed through a very fine filter to form cocoa powder (Are and Gwynne-Jones, 1994). From this state onwards, the processes for the manufacture of cocoa beverages and chocolates differ. The flow chart of processing cocoa beans to cocoa liquor, butter, cake and powder is shown in Fig 1 below



**Fig 1: Flow Chart for Cocoa Product Manufacturing**

### **Production of Beverages, Chocolate and Food**

Cocoa powder is passed to a mixing machine where finely powdered sugar and some vanilla or other flavouring are added each in the correct proportion. Continuous mixing is then carried out until they are properly mixed. The product is then packed in tins, nylon and paper, these are later packed in carton and sold as beverages. In case of chocolate, continuous mixing is then carried out until the original thick paste becomes liquefies. Then it passes through rollers in a refining machine. Although, the mixture which comes from the mixing and refining machines appears to be smooth to give the correct texture for plain chocolate. So if "plain" chocolate is to be made, the next process is known as "couching", one of the most important stages in the manufacture of chocolate. Its purpose is to produce a mixture completely smooth. The Couche is a machine with a series of granite troughs in which the mixture is pounded continuously backwards and forwards until the desired texture is obtained. For best quality chocolate, the mixture is couched for several days until it so smooth that no separate particle can be noticed when being eaten (Are and Gwynne-Jones, 1994).

For the assorted chocolates which are bought in a tin or box, the centres are first prepared and then the couched chocolates liquid, either plain or milk as required, is poured over them in a machine called "Enrobe". After cooling, these are usually wrapped separately in tin-foil and packed in cellophane. Similarly, biscuits can be coated with either plain or milk chocolate to make various kinds of chocolate biscuits.

### **Government Policy and its Effect on Cocoa Production and Processing**

After independence in 1960, the Nigerian Government decided to pursue a policy of industrialisation aimed to replacing imported goods with goods produced in Nigeria. This new industrialisation was financed by export taxes. As agricultural raw materials were Nigeria's chief exports, it was therefore the farm sector that effectively subsidised industrialisation. As the year passed by, the burden of taxation increased leaving the farmer poorer. Farmer were subjected not only to taxes on their export produced but also to import duties on consumer goods. These severe demands on a farmer's income lowered morale in the farming sector and had a damaging effect on cash crop production (cocoa, oil palm). While manufacturing increased its contribution to the nation's gross domestic product (GDP), agriculture's contribution to GDP had already falling by 1970 before the impact of oil (petroleum) had really been felt (Baker, 1989).

The marketing boards were established in the colonial era, farmers were offered a fixed price for their crops. The fixed price was always below the price paid by the traders, so the boards were doing farmer a dis-service. The government decided to restructure the marketing boards, ceased to be state operated and were replaced by a national board for each commodity. These were established for cocoa, groundnut, palm produce, cotton and rubber. Later, the marketing boards were abolished, so producers no longer have low prices forced upon them. Much needed credit is also to be more readily available to small holders. The abolition of market boards favoured Nigerian exporter and importer (NEXIM). They started exporting cocoa to the world market for exchange of hard currency (American Dollar). Exports stimulation loan was introduced in 1990. Cocoa processor loan was also approved for those that are ready to establish cocoa processing industry in 1990. Lastly, a grant scheme was also available whereby government will have certain percentage of shares in the industry. It is however noted that the implementation of the cocoa processor loan is yet to commence. Exportation is very high, hence the price of cocoa in the local market is high. The consequent effect is that the marginal profit of the cocoa processing industries is minimal.

## **RESEARCH METHODOLOGY**

Major cocoa processing industries in Western Nigeria were identified because most of the cocoa beans are produce from this area. Information were obtained through the use of questionnaire, personal interviews and interaction. The questionnaire was designed to identify the stages of production (flow chart), the effective utilisation capacity of the industry, and production level. The questionnaire also probes into the machine data like name and make of machine, source of acquisition of machine, machine capacity, maintenance schedule and condition of the machine. The questionnaire most importantly tried to identify the source(s) of raw materials (cocoa beans, cocoa powder, butter, cake), market outlet of product (within and outside the nation), technical problem(s) encountered and waste disposal problems. During the survey, fifty questionnaires were sent to the industries involved in the production of both the primary and secondary products. The status of persons contacted include Assistance General Manager, Production Manager, Personnel Manager, Head of Department both Electrical, Mechanical and Civil engineering, and also civil servants.

### Problem Encountered during the Survey

The survey was interesting, but there were some problems that hindered the questionnaire from being completed and to get the information related to the subject matter. Among these problems are: administrative bureaucracy, fear of technology stealing and imitation, fear of products quality comparison, lack of experts, misconception of the project and communication problems. Despite all the above problems interpersonal relationship, positive image, endurance and good communication potential have gone a long way to help information retrieval. Some parts of the questionnaire such as floor area of industries are generally disregarded by the respondent. This is because there is no enough data and documentation.

### RESULTS AND DISCUSSIONS

The industries contacted during the survey are divided into primary and secondary industries. Primary industries are those industries that are processing cocoa beans into cocoa liquor, cocoa butter, cocoa cake and cocoa powder, while secondary industries are those that are processing these products mentioned above into beverages, chocolates, cosmetics and pharmaceutical products. Some of the processing industries contacted during survey are listed in table 1 and 2 below

**Table 1: Primary Cocoa Processing Industries**

S/N	Name of Industry	Location	Product
1	Ile-Oluji Cocoa Mills	Ile-Oluji, Ondo State	Cocoa Liquor Cocoa butter Cocoa cake Cocoa powder
2	Coop Cocoa Processing Co	Akure, Ondo State	As in 1 above
3	Stanmark Cocoa Mill	Ondo, Ondo State	As in 1 above
4	Temple and Golders Ltd,	Ijebu Mushin, Ogun State	As in 1 above
5	Ebun Cocoa Industries	Iju, Lagos State	As in 1 above
6	Cocoa Industries Ltd	Ikeja, Lagos State	As in 1 above
7	Oregun Cocoa Mill	Oregun, Lagos State	As in 1 above
8	Ipoti Cocoa Processing Industries	Ipoti Ekiti, Ekiti State	As in 1 above
9	Ladi and Cocoa Factory	Ileshan Remo, Ogun State	As in 1 above



**Table 2: Secondary Cocoa Processing Industries**

S/N	Name of Industry	Location	Product
1	Nestle Foods Nigeria Plc	Ilupeju, Lagos State	Milo
2	Cadbury Nigeria Plc	Agidigbi Ikeja Lagos State	Bournvita
3	Cocoa Industries Nigeria Ltd	Ikeja, Lagos State	Vitalo
4	Ile Oluji Cocoa mill	Ile Oluji, Ondo State	Cocoa drink

Out of the fifty questionnaires administered only seven were returned. Out of the seven questionnaire completed, five were from primary processing industries while two were from secondary processing industries. The information collected from the ten filled questionnaires are summarised on table 3 to 5 as shown below.

**Table 3: Range, Mean, and Standard Deviation of Staff strength in the Cocoa Processing Industry**

**A Administrative Staff**

Status	Range	Mean	Standard Deviation
Director(s)	1-10	5	3
Senior Management Staff	5-33	12	10
Account Staff	2-15	7	5
Clerical Staff	7-70	30	24
Unskilled Staff	0-40	18	14

**B Technical Staff**

Status	Range	Mean	Standard Deviation
Engineer(s)	0-12	7	7
Technologist(s)	0-15	9	5
Technicians	2-74	36	25
Craftsman/Draftsman	Nil	Nil	Nil
Unskilled Staff	0-18	10	8

**Note- Mean and Standard deviation are approximated to the nearest whole number**

Generally, the industries are well staffed with technical and administrative staff. It is however worth noting that none of the industries have craftsman/draftsman on their employment roll. These groups of technical staff are required in the factory and workshop. They are required to participate in equipment fabrication and maintenance.

**Table 4: Range, Mean and Standard Deviation of the Production level in the Cocoa Processing Industry**

Production level (ton per day)			
Product	Range	Mean	Standard Deviation
Cocoa Liquor	5.0-30.2	18.0	10.7
Cocoa Butter	5.0-12.7	9.1	3.2
Cocoa Cake	0.0-14.7	8.2	5.0
Cocoa Powder	0.0-11.4	7.7	4.3
Beverages	2.4-8.1	11.2	9.1

From table 4 above, the production level of primary processing industries is relatively high when compare with secondary processing industries. It therefore suggest that, more of the secondary processing industries can still be established and well supply with raw materials locally. It also suggest that there are enough cocoa beans throughout the year for primary processing industries.

**Table 5: Range, Mean and Standard Deviation of the Capacity of the various machines in the Cocoa Processing Industry**

Machine Type	Range	Mean	Standard Deviation	Machine Condition (ton/day)
Bean Cleaner	1.6-120	31.1	51.2	Good
Destoner	1.6-80	23.0	33.2	Good
Winnower	1.6-80	23.2	33.2	Good
Roaster	1.6-72.5	21.0	30.1	Good
Map mill	2.0-55	18.7	23.3	Good
Bill mill	0.4-55	17.8	23.8	Good
Press	0.6-72	26.5	33.3	Good
Tempering	0.6-72	26.4	32.5	Good
Kibbling	0.6-72	26.4	33.8	Good
Reactor	0.6-24	10.1	11.1	Good

From table 5 above the machine capacity are relatively high. They are in good condition and properly maintain in conjunction with foreign partners.

### Source of Raw Materials

The major raw material for primary industries is cocoa beans. From the questionnaires, it was gathered that the beans are usually bought from farmers through the cocoa dealers and not directly from the farmers in most cases. The Nigeria exporters usually create problem for the local cocoa processing industries by exchange cocoa beans with America Dollar in the world market. Hence, cocoa beans are obtained locally at an exorbitant high price.

The secondary processing industries source their raw materials from the primary industries. Formerly, they import these products from the European countries but nowadays, they are buying them from the local processing industries. Most cocoa processing industries have no problem of waste disposal. The only waste generated is cocoa shells which are sold to individual or corporate bodies who make use of them for manufacture of soap and animal feed.

### **Technical Problems**

The present condition of the machine are good but some parts of the machine wear fast. Since the machines are imported, their parts are also imported. The beans are not always available throughout the year simply because there is bimodal season for cocoa. Another problem is irregular supply of electricity for the industries, and those could afford to buy generators which is additional cost, there is mostly problem of scarcity of petrol or diesel to run the generators.

### **Government Policies as Affect the Cocoa Processing Industries**

From the questionnaires returned, it was gathered that government is not helping matter. Present government policies allow the liberalisation of cocoa beans export and the devaluation of the value of naira. The local processor are not financially buoyant to purchase raw cocoa beans, they mostly depend, on a third party such as the bank and foreign partners for financial assistance. All these factor prevent the large scale cocoa processing industries from operating at full capacity.

### **CONCLUSIONS AND RECOMMENDATIONS**

This study has shown that, there is sufficient cocoa bean in the nation for the primary processing industries who in turn are generating sufficient raw materials for the secondary processing industries. Most of the industries are well staff but none of the industries have craftsman/draftsman /artisan employed, this could have effect in the overall performance of the industries. From the opinion sample, government policies are not favourable to the progress and expansion of cocoa processing industries in Nigeria. Based on the study, it is therefore recommended that, there should be on the job training for the technical staff in order to maintain the machineries with less foreign participation and develop indigenous machineries before the imported machineries expire their serviceable life. The industries should work hand in hand with research institution so that latest production and maintenance technology can be practised in the

industries. And finally, government should provide a good environment (electricity, good road, water supply and other social amenities) for the cocoa processing industries so that, new ones can be established, government should also discourage exportation of cocoa beans so that raw cocoa beans would be available for local cocoa processing throughout the year.

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