

## **AGRO-PROCESSING TRAINING**

### **Module 1: Agro-Processing in Nigeria**

One of the major differences between the developed and developing countries is the culture of adding value to commodities; whilst the developed world maximizes the value to its exports the developing world sells raw commodities without any value input.

For example, chocolate is one of the world's most popular sweet treats, and in 2014, the global sales of chocolate fetched a staggering \$100 billion. Meanwhile, Ivory Coast and Ghana are the world's number one and two producers of cocoa beans which is the raw ingredient for making chocolate. Surprisingly the two countries earned a paltry \$8 billion in cocoa exports in the same year which is a far cry from what the processors earned.

In the global value chain for chocolate, the value is skewed heavily in favour of processors, marketers and distributor whilst the cocoa growers receive just 6% of the price that consumers pay for chocolate. This underscores the fact that the farmer who sells his products raw and does not add value to the product remains the least paid in the agricultural chain.

Field interviews with Friesland, Chi-Vita, Coca-Cola and Dangote shows that West Africa imports over \$2billion and \$1billion milk powder and fruit juice concentrate respectively. However, little attention has been given to the value chains through which agricultural products meet end-users within the country and abroad. The magnitude of opportunity losses caused by this neglect becomes obvious if one considers the added value and employment gains that can be generated along agro value chains from commodity to consumption.

While developed countries add over US\$200 of value by processing one tonne of agricultural product, developing countries add less than US\$50. Furthermore, while 98% of agricultural production in developed countries undergoes industrial processing, in developing countries barely 30% is processed. Yet agro-processing industries in developing countries generate 40% to 60% of manufacturing value-added and agro-industrial products account for as much as half of their total export. Examples of some products that worth a lot more if exported its processed form include Sorghum, Cassava, Rice, and Frozen chicken among others.

## **Module 2: The Agro-Processing Industry**

A common and traditional definition of agro-processing refers to the subset of manufacturing industry that processes raw materials and intermediate products derived from the agricultural sector. The agro-processing industry thus means transforming products originating from agriculture, forestry and fisheries to finished product.

The potential for agro-industrial development in the developing countries is largely linked to the relative abundance of agricultural raw materials and low-cost labour in most of them. In a study conducted by UNDP which involved Individual in-depth interviews with major agro-processing firms, it was revealed that an overwhelming \$10billion Private Sector Investment Opportunities exist in the agro-food industry. This includes:

- Establishment of fruit concentrate processing facility in Nigeria to supply over \$1billion market in West Africa
- Investment in large scale cassava plant to exploit over \$2billion starch market in West Africa

- Commercial cultivation of soya bean and other oil seed plants in Common Market for Eastern and Southern Africa (COMESA) and West Africa to meet over 400,000tons supply gap
- Investment in commercial production of sorghum in East and West Africa to serve the breweries and the World Food Program
- Intensive production technologies for fresh vegetables to exploit increasing urban market demand
- Production of milk concentrate in West and Southern Africa to exploit over \$2billion urban market
- Aquaculture/Fish Production; Nigeria alone imports over \$900million of fish.
- Maize and rice production to exploit over \$5billion domestic market

Agro-processing is important for many reasons, chief of which is a reduction in post-harvest losses. The scope of the agro-processing industry encompasses all operations from the stage of the harvest until the material reaches the end-users in the desired form.

An important feature of agro-processing industries is that they are a major source of employment and income, thus providing access to food and other necessities to large groups of the population. They are, therefore, essential elements in the attainment of food security goals.

A factor underscoring the importance of agro-processing activities as sources of employment and earnings relates to the differences in productivity between, on the one hand, raw material production – where gains have been in many cases spectacular – and, on the other hand, agro-industry.

### **Module 3: The Best Practices of Agro-Processing**

Food processing is the method and technique used to transform raw ingredients into food for human consumption. Food processing takes clean, harvested or slaughtered and butchered components and uses them to produce marketable food products.

Agro-Processing is a branch of food science. Processing of food leads to the preservation of food, enhances its flavour and reduces the toxins in the food product. It leads to better distributional efficiency and helps in the easy marketing of food products.

Food processing being a capital-intensive industry is also a water-consuming industry. Water being the most important resource, the food processing industry should make efforts to reduce the wastage of water. Food processing is referred to making food that is nutritious to include food fortification in which vitamins and minerals are added to food during processing.

Changing lifestyles, food habits and tastes, increased income, and the transition of food culture has led to the growth and demand for agro-processing. Food safety and nutrition is a matter of concern because processed food products have an impact on health.

For the best agro-processing experience, the following methods should be adopted;

- Use raw materials of good quality
- Minimize wastage during handling, preparation and processing of raw materials and packaging of processed foods
- Use appropriate technology and process equipment to minimize energy consumption

- Minimize the wastage of water by reasonable care during preparation and processing without sacrificing quality
- Use recyclable or biodegradable packaging material as far as possible
- Recycle raw material and process waste as far as possible

#### **Module 4: Types of Agro-Processors**

Nigeria is blessed with abundant resources but we have consistently failed at maximizing the use of these resources because of our inclination to sell raw products to nations who will process or refine and then sell the finished goods back to us at ten times the cost of the raw material e.g. Crude Oil/ Petrol, Cashew Nuts/Cashew Snacks, Cocoa/ Chocolates etc.

This is also true of domestic products e.g. the cassava farmer that fails to process his crop to Garri would eventually have to buy Garri from the local market far above the price he sold the cassava or if a tomato farmer fails to process his crop he will eventually have to buy tomato paste in the market at a higher price

#### **Range of Agro Processors**

- Oil Expellers
- Extruder for Full Fat Soya
- Animal Feed Mills
- Fish Pellet Plant
- Garri & Fufu Production Plants
- Palm Oil Mill
- Multi-grain thresher
- Maize sheller
- Fish Dryer
- Multi-purpose dryer
- Pelletizing machine (fish/ livestock)

- Rice De – Huller
- Palm Kernel Cracker/Separator
- Chicken Quartering Machine
- Shea Butter Processing Plant
- Soap Production Machine
- Block making machine

Agro-processing can be classified into three major commodity groups: Crop processing, Livestock processing, and Fish processing. Another latent area is forest wood processing.

### **Module 5: Determining Your Agro-Processing Niche**

In determining your agro-processing niche, the following should be considered:

- Enhanced agricultural productivity and increased farm household incomes
- It should be able to provide year-round of affordable safe and nutritious food
- It should be able to create jobs for rural and urban youth
- A good agro-processing factory should be able to produce fortified foods for vulnerable groups in society.
- Ensure it establishes indigenous food standards
- It should be located at areas close to raw materials to be processed, as well as where they will be utilized. Large quantities of agricultural “waste” produced in one location which can be transformed into useful products such as animal feed need to be closer
- it should reduce importation of similar or foreign foods and conserve foreign exchange
- it should meet the standards of export to sub-Saharan countries with inadequate resources for agriculture

## **Module 6: Setting Up Your Agro-Processing Business**

To start a food processing and packaging business as a manufacturer in Nigeria, you must be registered with the National Agency for Food and Drug Administration and Control (NAFDAC), Standard Organisation of Nigeria (SON), Corporate Affairs Commission (CAC), and the Federal & State Ministries of Health.

The food processing and packaging industry has hundreds of business ideas and opportunities within it to not just aid a savvy entrepreneur to grow a successful business but to also create thousands of jobs in the process. Nigeria's food processing industry is valued at over \$10 billion. The food processing industry in Nigeria provides an estimated minimum of 10 million direct jobs.

### **How To Start Your Agro-Processing Business**

**Select the Business You Want to Start** - The first step is to do a feasibility study and determine the right food processing and packaging business for you to start up. By doing this, you can determine the most cost-effective and prospectively profitable business to venture into that has a very large market you can easily serve.

**Register Your Business with the Required Bodies** - If you'll be processing and packaging your food items yourself, you're required to register your business with these mandatory bodies which include NAFDAC, SON, CAC, and also the ministry of health. If you're not going to be processing and packaging but only distributing, you can go ahead to start up your business, but essentially, when you get a large and very noticeable distributor or retail chain, you'd be required to register with those bodies.

**Setup the Facility and Purchase the Required Equipment** - Every processing facility has a set of standards it must adhere to and also has a set of items it must have. Some things to set up next are:

- The Processing Plant
- Equipment and machinery like grinders, boilers, deep fryers, cutters, mixers, etc
- Food items based on what products you intend to start processing
- Packaging raw materials that would be used to produce the packs the processed food items would be put into

### **Challenges of the Agro-Processing Business**

Some of the challenges of food processing and packaging in Nigeria and many parts of Africa include:

- Lack of experience
- Low and unstable investment in agricultural research
- Financial Constraints
- Storage Constraints
- Farm Inputs Constraints
- Infrastructural Constraints
- Marketing Constraints

### **Module 7: The Economy of Agro-Processing**

1. **Employment creation and generation of income** - The agro-industry can absorb a vast amount of manpower in the primary and secondary level of production. Due to the seasonality of agriculture, a production season may experience high and low demand for labour on the farm. Conversely, after harvesting the processing industry can absorb a whole lot of manpower thus creating jobs for the unemployed and generating income for their livelihood.

2. **Contribution to a nation's GDP and manufacturing industry** - Most developed countries like Brazil and some Asian countries get huge returns from the export of agricultural products mostly in their processed forms, an example is rice. Majority of the inputs in the manufacturing industry are agricultural products. Rubber Latex is used as a raw material in the shoe and tyre industries.
3. **Promotes socio-economic development** - Strong synergies can exist between agro-industry, agriculture and poverty alleviation. Agro-industry provides capital and services to farmers (e.g. seeds and equipment, training, production and market information), promotes entrepreneurship, raises the demand for agricultural products and connects farmers with markets through the handling, processing, marketing and distribution of agricultural products. As a result, productivity and quality of agricultural production, farm returns, and economic stability for rural households, food security and innovation throughout the value chain can be enhanced.
4. **Regional stabilization and sustainability** - The dense population of the urban areas can be mitigated by adequately developing economic activities in the rural region. Making agriculture lucrative for the rural inhabitants will curb excess migration and foster economic sustainability for the region.
5. **Integration into global markets** - Most of what we produce are consumed in the country with only a little portion being exported. This is because we barely produce enough to meet our local demand which in turn fosters importation of supplementary products. With the current attention the agro-industry is receiving, production is geared towards making Nigeria an Agric export country allowing us to compete in the global market.

6. **Improving food self-sufficiency** - Processing can also extend the period of availability of food products, reducing the "hungry gap" between harvests and mitigating the seasonal rise in food costs at these times, which puts so many people at a nutritional risk. Several new technologies and refinements of the traditional procedure are now available for rural people to use at the village level.

### **Constraints Facing the Agro-Processing Industry**

**National and Regional Policies-** There is no separate policy articulation for the development of agribusiness except for the brief objectives stated in the 1988 Agricultural Policy for Nigeria document for agricultural commodity processing. The objectives of that section of the agricultural policy are stated as follows:

- To widen the demand base for agricultural commodities and, hence, accelerate the rate of growth of the agricultural sector;
- To preserve perishable agricultural commodities thereby reducing their level of waste and degree of seasonal price fluctuations;
- Diversify employment opportunities in the rural areas through the establishment of rural-based, small scale agricultural commodity processing industries.

There is no specific national policy that focuses on the development of agribusiness as an important sub-sector; especially in the areas of agricultural commodity quality standardization, storage, processing, packaging, haulage, and marketing. The Nigerian industrial policy is outdated and inconsistent with the situation of today. The last industrial policy was formulated in 1985 and ever since then, the government has been unable to come out with a comprehensive industrial policy for Nigeria.

**Infrastructure** - The most serious business problem in Nigeria is the state of infrastructure and the biggest infrastructure problem is electricity. The deficiencies in the supply of electricity are, by far, the biggest infrastructure problem.

The response mechanisms to the notorious inefficiency in public electricity supply include private provisioning, where firms purchase and use their own electricity plants, factor substitution, where firms adjust machinery from electronic to mechanical or manual; output reduction where firms reduce their output and product substitution where firms reduce the range of their products in the market.

These responses are costly, as they lead to low capacity utilization, reduced output, and high production costs. These costs are in the final analysis transferred to the final consumer while some firms in the recent past have considered relocating their plants to Ghana and Côte d'Ivoire.

Other infrastructural problems include access to land, good roads, storage facilities, water and transportation among others.

**Finance** - The next major problem in the Nigerian business sector is the high cost of funds arising from the depreciation of the local currency (Naira) against major currencies coupled with high lending rates and extreme difficulties in accessing credit for working capital, especially for small agribusiness ventures.

**Unpredictable Government Actions** - There is a high level of uncertainty and lack of confidence in government and its intentions for the business sector especially with the inability to predict government policy. Uncertainty arises basically as a result of the conflicting objectives of government agencies.

It is an oversimplification to speak of "the government" as there are in Nigeria, a plethora of agencies of government that oversee the workings of the business environment. For instance, while the Federal Ministry of Agriculture and Rural Development has the mandate of supervising farmers, the Federal Ministry of Industries oversees agribusiness firms and large industries, while the Federal Ministry of Environment oversees matters related to industrial waste and effluents.

The Federal Ministry of Finance along with the Central Bank of Nigeria control matters of credit, regulate the merchant and commercial banks, foreign exchange, interest rate, and import or export regulations. But inter-ministerial relations are almost non-existent leading to implementation conflicts and this is one reason for policy inconsistencies in the Nigerian agribusiness environment.

**Farm Constraints** - At the farm level, there are scattered irregular plots of subsistence smallholder production that characterize the Nigerian agricultural system. Geographically, farmers are dispersed and unorganized so that the cost of bulking and consolidating their produce for commercial supplies is enormous. To circumvent the problem of bulking logistics, it is often advised to put farmers into groups.

**Market Information Service** - Market-oriented production requires the use of a real-time market information service. Daily information on market prices can be found in newspapers for traditional export crops such as cocoa but is completely lacking for other crops of industrial importance such as rice, sorghum, cassava, maize, and horticultural crops.

Existing market information services are of no assistance to farmers and agribusiness firms as information is collected monthly by public agencies, basically for research purposes. Hence, both farmers and agribusiness firms are forced to operate in a non-transparent and speculative business environment.

Many agribusiness firms and farmers are unable to ascertain beforehand where to buy or sell commodities to maximize profits and reduce the risks associated with marketing. This has created a class of market agents who have capitalized on this non-transparent market situation and lack of information to rip off both farmers and agribusiness firms in Nigeria. In general, the agribusiness sector in Nigeria is not price-competitive and lacks service linkages to finance technology and export sectors due primarily to the absence of a national market information service.

However, despite the obvious challenges facing the agro-processing industry, it is still a very profitable and lucrative venture as it is the only highly viable lee-way for escaping the looming economic issues facing the nation and the world at large.

Developed nations have long taken giant steps exploring and benefitting from the opportunities it presents for total economic restoration on a personal, national and international level.

### **Module 8: Market Access**

Agricultural Marketing is a process which starts with a decision to produce a saleable processed or farm commodity, and it involves all the aspects of market structure and access, both functional and institutional, based on technical and economic considerations, and include pre- and post-harvest operations viz., assembling, grading, storage, transportation and distribution.

Marketing of agro-processed products also depends on transport. We must have an efficient and economical network of road-rail transport for home trade. Adequate and cheaper transport can widen agro-processed goods markets and offer remunerative prices also.

### ***Categorization of Food Processing Businesses***

As an industrial business, it could be categorized into three;

**Small Scale:** Some food items could be processed easily like boiled groundnut, snacks etc. It doesn't require many ingredients and doesn't take much time and effort either.

Note that the food processing businesses you could do small scale, their ingredients are readily available. It doesn't need heavy machinery and it is easily sold to consumers. Some good examples are the zobo drink, Moi Moi, and Akara.

**Medium Scale:** Food items that cannot be processed simply by stirring, frying or boiling in a big pot are considered to be medium scale. This is something the normal kitchen setting cannot handle, where the food item is not easily processed and it might need some serious machines.

An example is the ice cream production business. A food item you could do small scale like the zobo we mentioned can be done at a medium scale by catapulting it business-wise to having things like better packaging and increase in production quantity. You provide for a large consumer audience, perhaps by selling to supermarkets and the like.

**Large Scale:** To process food items that would be enough for export which must meet international food standards, you have to opt for large-scale production of the food item. More complicated food mixtures are usually done large scale.

### **Distribution and Exportation**

The Asia region is the leading importer of Nigeria's agricultural commodities. The region accounted for 59% of total exports in 2018 (2017: 52.7%). Europe - 34.5% and America - 3.6% are the second and third-biggest markets for Nigeria's agricultural goods in 2018. However, both regions' share of exports in 2018 dropped from 35.9% and 6.5% respectively recorded in 2017.

In absolute terms, the export value of agricultural goods to Asia in 2018, grew by 167%, from N67.3 billion in 2017 to N179.6 billion. The growth was mainly driven by demands from Japan, India and China. Trade in agricultural goods between Nigeria and the rest of Africa is still relatively small compared to other regions of the world. Agricultural exports to other African countries declined by 6%, from N4.1 billion in 2017 to N3.9 billion in 2018.

### **Major Agricultural Goods Exported from Nigeria**

Sesame seeds, cashew nuts, fermented cocoa beans and superior quality raw cocoa beans – with a combined total export value of N210.2 billion accounted for 69.5% of total agriculture exports in 2018.

### **Challenges of Agricultural Exports in Nigeria**

Logistic challenges at the ports - Nigeria's two major ports, Apapa and Tin Can ports, are responsible for processing the bulk of trading activities in the country, but infrastructure and logistics challenges continue to impact export, as well as import activities.

The Nigerian Cashew Association of Nigeria (NCAN) alleged that in March 2019, there was an incidence of delayed shipment of 50,000 tons of cashew valued at \$300 million due to gridlock in accessing the ports. Other agricultural products for export are affected too. The consequences of the gridlock include escalation in haulage costs, reduction in export prices due to degradation in the quality of produce while on extended transit to the port, and decline in foreign exchange accruable from non-oil exports.

Inadequate storage facilities and poor distribution network - Lack of adequate modern storage facilities for agricultural produce has led to significant post-harvest losses on account of produce perishability. The Federal Institute of Industrial Research, Oshodi (FIRO) puts Nigeria's post-harvest losses at \$9 billion annually. In the same vein, the poor distribution network of farm produce from the major food belts is equally hampering the quality and quantity of agricultural exports in the country.

Poor quality of agricultural products for exports - The quality of agricultural products from Nigeria is relatively poor. This is due to poor handling of agricultural products (pre- and post-harvest period), diseases and pests attacks on crops and excessive use of pesticides for preservation purpose.

Low value-addition to agricultural products - Lack of value-addition to agricultural goods exported has resulted in a significant loss in earnings accruable to the country. According to the Food and Agriculture Organization (FAO), Nigeria's value-added per capita in agriculture has risen by less than 1% annually, over the last 2 decades.

### ***Opportunities and Prospects of Agricultural Exports in Nigeria***

The Nigerian agricultural sector is replete with diverse opportunities. Being able to effectively harness these opportunities will drive agricultural development and expand agricultural export. For instance, analysis by the Nigerian Export Promotion Council (NEPC) shows that the total amount of estimated untapped potential by 2021 for Nigerian exports of cocoa beans to the ten best markets (Germany, Malaysia, Singapore, Turkey, Netherlands, Italy, Japan, France, Mexico and Indonesia) is around \$425 million.

In the same vein, the estimated worth of cocoa butter for the top ten markets was put at \$81.9 million, while the value for untapped potential in the market for cocoa paste by 2021 stood at \$6.3 million. The untapped market potential for sesame seeds to the top ten markets (China, Japan, South Korea, Mexico, Poland, France, Lebanon, the United States, Canada and the UK) is estimated at US\$170 million.

According to the NEPC, the largest estimated untapped potentials for Nigeria is in China, which accounts for an estimated 65% of the total potential value. China is currently the third-largest agricultural export destination, after Turkey and Japan. Overall, agriculture experts are of the view that the country has the potential to generate US\$40 billion annually from the export of agricultural goods.

Though Nigeria is yet to sign the African Continental Free Trade Area (AfCFTA) agreement, some analysts posit that the arrangement offers a huge opportunity for Nigeria's burgeoning economy, vis-à-vis providing increased accessibility to a large market for the country's agricultural and other exportable goods.

The AfCFTA, being a common market arrangement, will encourage the unhindered flow of Nigeria's agricultural goods to key markets in Africa that

require it. However, the country will need to improve on the issues and challenges impacting agriculture export growth in the short to medium term, to capitalize on the advantages of the untapped market potential that AfCFTA provides. *"We have a lot of potential export growth across a range of key food commodities...but we need to address key barriers if we are going to succeed."*

Instructor's Manual