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# **AFRICAN COCOA INITIATIVE**

## **ASSESSMENT OF COCOA- FARMING INPUT DELIVERY SERVICES IN NIGERIA**

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**FINAL REPORT SUBMITTED BY**

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**For the World Cocoa Foundation**



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## 1. INTRODUCTION

Nigeria is one of the largest and most populous countries of Africa. It lies on the West Coast of Africa and wholly within the tropics. It is bounded on the West by the Republic of Benin, on the East by Cameroon and Chad Republic, on the North by the Republic of Niger, and on the South by the Atlantic Ocean.

Nigeria enjoys a tropical climate with distinct wet and dry seasons. The dry season usually starts from November till March, whilst the wet season covers the months of April to October of each year. The rainfall pattern in 2012 and the devastating floods in many parts of the country is being closely monitored for its effects on agricultural production in Nigeria. Annual rainfall is usually between 2500-3200mm with about 73% humidity in the South, while it is about 700-800mm in the North. The temperature is generally high with an average of 27<sup>o</sup>c except in the Jos, Mambilla and Obudu Plateaux where the temperature is relatively cool all year round. There are two (2) broad types of vegetation in Nigeria namely forest (where there is significant tree cover) and Savannah (insignificant tree cover, with grasses & flowers located between trees.) Each of these has many variants affecting the floristic diversity and the structural appearance of the plant communities.

In Nigeria, agriculture accounts for about 42% of the Gross Domestic Product (GDP) in 2009 and cocoa alone contributed 27% of this GDP. About 40% of the population is dependent on agriculture and around 35% of the labour force is employed in this sector. The country can be divided into three (3) broad ecological zones, namely the Southern tree and root crop zone (which occupies the rain forest belt), the mixed crops zone of the Guinea savannah (middle belt) in which climatic conditions allow the growth of root and grain crops, and the Northern zone covered by the Sudan savannah which is dominated by production of grains. In view of the foregoing, production of tree crops such as, cocoa, oil palm, rubber, cashew, etc. is restricted to the southern forest belt.

Cocoa is a perennial tree crop which requires an altitude of 100-300m, rainfall of about 1350-1800mm per annum which must be distributed evenly over 6-8 months of the year. The average temperature required is about 25.5<sup>o</sup>C. Also required is deep and well- drained soil which is high in nutrient content with a top-soil (1.5-2.0m) rich in organic matters. Cocoa requires reasonable shade during the first 5-6 years of its growth in the field or until the canopy is closed.

Consequently, the above-mentioned conditions limit the production of cocoa (commercial quantity) in Nigeria to the twelve (12) southern states of Ekiti, Ondo, Osun, Oyo, Ogun, Edo, Delta, Abia, Akwa Ibom, Cross River, Kwara, Kogi and two (2) Northern States of Taraba and Adamawa as shown in Appendix 1. Over five (5) million Nigerians are engaged one way or the other in the cocoa value chain and it is estimated that over 400,000 hectares of land is under cultivation with a national production output of about 250,000 tonnes in 2010/2011 cocoa season.

Cocoa, *Theobroma Cacao* (Family- *Sterculiaceae*) originated from the hot humid region of the lowland tropical forest of the upper Amazon Basin of South America. Various cocoa hybrids are produced involving crosses between *Amazon*, *Trinitario* and *Amelonado* varieties for production of desirable attributes, such as high yielding capacity, improved beans size, early maturity, disease resistance, good flavour and other desirable characteristics. Cocoa was introduced to Nigeria at about 1874 with the *Amelonado* varieties which came to bearing fruits after five (5) years. The *Amazon* variety which came to bearing fruits as early as three (3) years was introduced to Nigeria through Ghana between 1948 and 1950. There were subsequent introductions from Trinidad and Tobago at about 1964-1970. However, continuous and focused research process has resulted into the introduction of other varieties, such as F3 Amazon, WACRI Cocoa hybrid series II, CRIN Elites, etc. with desirable disease tolerance/resistance attributes, commercial qualities and adaptability to various ecological zones.

The cocoa industry in Nigeria grew through the initiative of peasant farmers having small holdings of about 1-3 hectares with low yields and facing very high incidence of pests and disease due to lack of exposure to scientific knowledge about good husbandry. However, the situation has changed dramatically with the impact of sound research findings, successful extension services and availability of conducive land, as well as favourable climatic conditions. The first export of cocoa beans from Nigeria into the international market was 3000 metric tonnes in 1910 and it rose gradually to 307, 000m.t during the 1970/71 cocoa season, but declined thereafter due to many reasons. Strenuous efforts are now being made by all stakeholders in the cocoa value chain to raise the national production output above 300,000 m.t. again within the shortest time possible.

One of the major constraints to improvement of the annual cocoa production output in Nigeria is inefficient control of pests and diseases. Cocoa is a crop that requires tender care right from the nursery to the harvested beans in storage because it is highly susceptible to pathogens which can cause substantial losses to the farmer. Continuous research efforts are in progress on production of improved varieties, through breeding, which incorporate disease and pest-resistant/tolerant qualities. Progress is also being made on chemical and non-chemical methods of control under the Integrated Pest Management Strategy (IPMS). However, the most effective method of isolating crop and cocoa beans from the attack of diseases and pests remains, up till date, the precisely-timed, well- targeted application of approved chemicals.

The production and marketing of chemicals for use on the cocoa tree and stored beans will remain a lucrative business until when all stakeholders in the cocoa value chain are able to develop proven techniques which can reduce the need for chemical controls. A recent report indicated that Ondo State alone requires pesticides worth ten billion, seven hundred and sixty-five million and nine hundred and eighty thousand naira - N10,765,980,000 - or sixty eight million, two hundred and fifty-one thousand, four hundred and twenty-six dollars - \$68,251,426 - per annum for fungicides and pesticides alone. This represents about 40% of the nation's need in cocoa inputs per annum.

The current reality is that without adequate chemical control of pests and disease of cocoa, the multi-billion dollar cocoa business may collapse as the supply of cocoa may dry up.

Ineffective control of pests and disease usually results in severe crop losses by the cocoa farmers and disruption of the global supply. Furthermore, improper use of these agro-chemicals by the farmers may pose very serious threat to the health of growers and consumers of cocoa and its by-products, as well as the environment.

In view of the foregoing, this study commissioned by the World Cocoa Foundation under the African Cocoa Initiative on assessment of the cocoa-farming inputs delivery services in Four (4) countries, namely, Nigeria, Cameroon, Ghana and Cote D'Ivoire is very timely and eminently urgent.

The main focus of the study includes comprehensive review of the registration/regulation procedures, distribution network and technical capacity building for cocoa inputs with the aim of expanding the range of services, accessibility and best use of these chemicals in the countries concerned.

## **2. KEY APPROVED AGRO-INPUTS AND THEIR IMPORTERS IN NIGERIA**

All agro-chemicals for cocoa production in Nigeria are usually subjected to field and laboratory trials by Cocoa Research Institute of Nigeria (CRIN) and laboratory analysis by the National Agency for Food and Drug Administration and Control (NAFDAC) before approval is given for sale and distribution in the country.

Appendix 2(a) shows the list of key importers of agro-chemicals which were tested and recommended by CRIN and registered for importation by NAFDAC for the control of insect pests (insecticides), fungal diseases (fungicides) storage chemicals (fumigants) and weeds (herbicides).

This study shows that it takes about 3 years for completion of both laboratory tests and field trials of new products by CRIN. Abridged field trials lasting about one year are usually done for familiar products (with the same active ingredients), which had previously been tested and approved by CRIN thus reducing the screening period considerably. Chemical analyses are usually done by CRIN to confirm the active ingredient and inert components of the agro-chemical while "in vitro" screen-house or laboratory tests are carried out to determine the potency of the chemical on target. Field trials are also carried out to enable CRIN collect data on phyto-toxicity, efficacy, agronomic and environmental effects of these chemicals on the crop, soil, farmers and the environment. Dried cocoa beans collected from the field trials are usually coded and sent to external laboratories for taint and pesticides residue analysis, and it takes about 6 months before the analytical results are received.

Agro-chemicals with positive results are usually recommended by CRIN through the Agricultural Research Council of Nigeria (ARC�) for the final approval of the Honourable Minister of Agriculture.

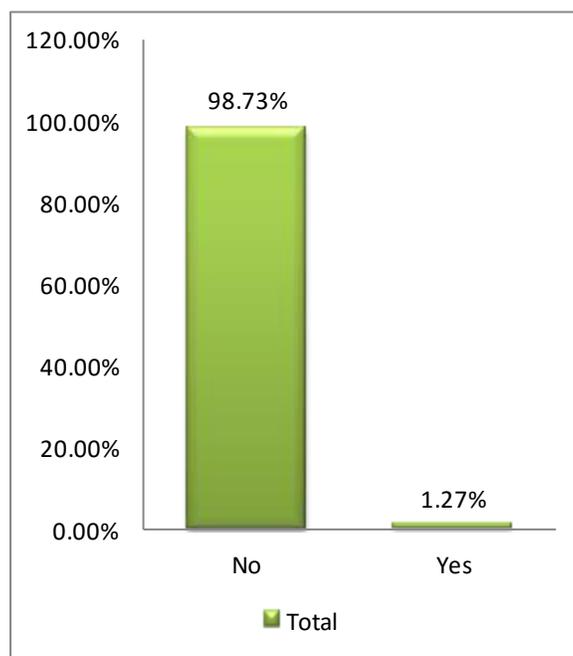
This study also confirmed that it takes an average of six (6) months to register each of the chemicals with NAFDAC which carries out mainly laboratory analysis to confirm the type, concentration and acceptability of the active ingredient and inert components in accordance with international safety standards.

These two government agencies are not involved in distribution and farm-level monitoring of the safe and responsible use of these chemicals by cocoa farmers after laboratory tests, fields trials and registration.

Most of the importers who claimed that their products have been in the Nigerian market for over three (3) years complained about the high and discouraging costs of laboratory tests, field trials and documentation in CRIN as shown in Appendix 3 (a).

The use of fertilizer and herbicides were not very common in most cocoa farms visited. Most of the farmers believed that the soil under cultivation is still fertile and that falling leaves can replenish the soil nutrients adequately. Most of them were not willing to add the cost of fertilizer to their overall cost of production. Figure 1 shows that 98.73% of cocoa farmers interviewed were not using fertilizer in their farms.

**Figure 1: Fertilizer Usage in Cocoa**

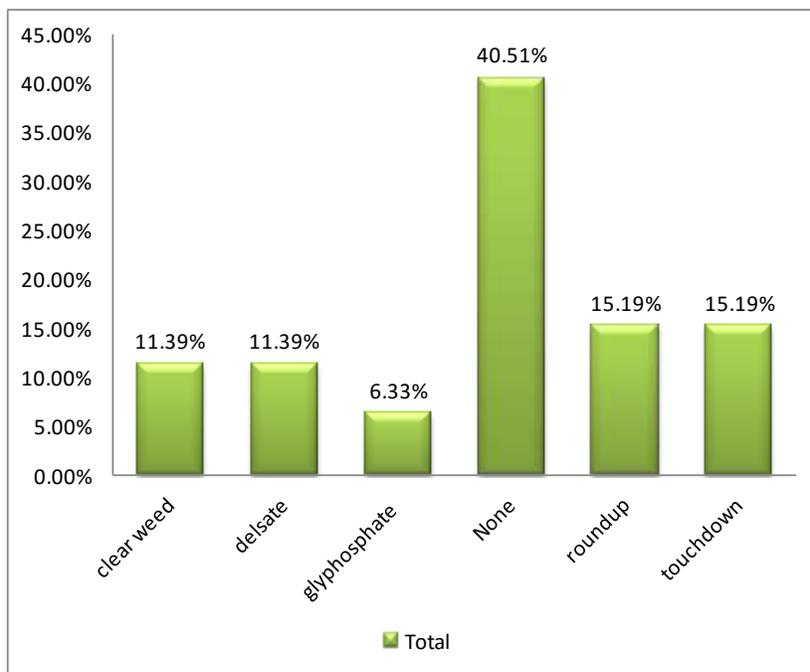


However, research findings in CRIN have shown positive yield improvements in cocoa with the use of fertilizer in support of nature to replenish the depleting essential soil nutrients. Consequently, CRIN confirmed that it has completed field tests on its own fertilizer “recipe” which may be made available in commercial quantities very soon. It advised that for achievement of desired results, farmers must be trained on how to use simple “Quick soil test kits” to determine nutrient requirement before fertilizer application.

Similarly, farmers do not see weed control in their cocoa farms as a serious problem because mature cocoa smothered weeds. The residual weeds under mature cocoa trees can always be controlled through slashing by direct labour. However, weed control in young cocoa, as in arable farms, is gradually becoming an economic limitation to cocoa development, growth and productivity. Today, labour is becoming increasingly unavailable,

even when the farmer is willing to pay. Therefore the use of herbicides has quietly crept into cocoa production. Figure 2 shows that while 40.51% of randomly selected cocoa farmers in different states do not use herbicides, 30% use either Roundup or Touchdown Forte and 11.39% use Delsate which has not been approved by CRIN.

**Figure 2: Types of Herbicides used in cocoa farms**



Detailed field survey results using fifteen randomly selected cocoa farmers in each state with structured questionnaires are shown in Appendices 4 (a-l).

### **3. CHANNELS OF DISTRIBUTION OF AGRO-CHEMICAL INPUTS FOR COCOA IN NIGERIA**

All the approved agro-chemical inputs and sprayers were imported into Nigeria by the companies shown in Appendices 2 (a) and 2 (b). Furthermore, they are responsible for marketing, sales and distribution within the country.

The importers enjoy a concessionary import duty of 5% and they are also exempted from payment of value added tax (VAT) on these agro-chemicals.

Most of these Importers rely on accredited agents/dealers, licensed-buying agents of cocoa (LBAs), farmers organizations & cooperatives, government agencies and the open market for the sales and distribution of their products as shown in Appendix 3 (b).

Most exporters of cocoa beans in Nigeria usually give either cash loans or chemicals to farmers through their LBAs, and in some cases directly to the farmers. The Exporters are reimbursed for the cost of these chemicals with either cocoa beans or cash during the harvesting season.

Some state governments in the cocoa-growing areas have set up agencies which are responsible for bulk purchase of agro-chemicals with “Seed Funds” from government. This distribution channel is very prominent in Ondo State (the largest cocoa-producer in Nigeria). The unit is called Ondo State Agricultural Inputs Supply Agency (AISA) with its headquarters in Akure (the state capital). AISA has branches called “Farm Service Centres” (FSC) in all the eighteen Local Government Areas of the State. Each FSC is manned by trained officers from the agency, Tree Crop Unit (TCU) and the Extension Department of the State Ministry of Agriculture for necessary field support, counseling and advisory services to farmers. They sell only approved agro-chemicals to cocoa farmers at a retail price which includes 30% subsidy in their distribution outlets, and also on community market days, in order to ensure easy access to these inputs by the cocoa farmers.

It is gratifying to note that the Ondo State Government (along with other cocoa producing states) is now partnering with the Federal Government of Nigeria in the implementation of the Growth Enhancement Support (GES) under the Cocoa Transformation Programme in Nigeria.

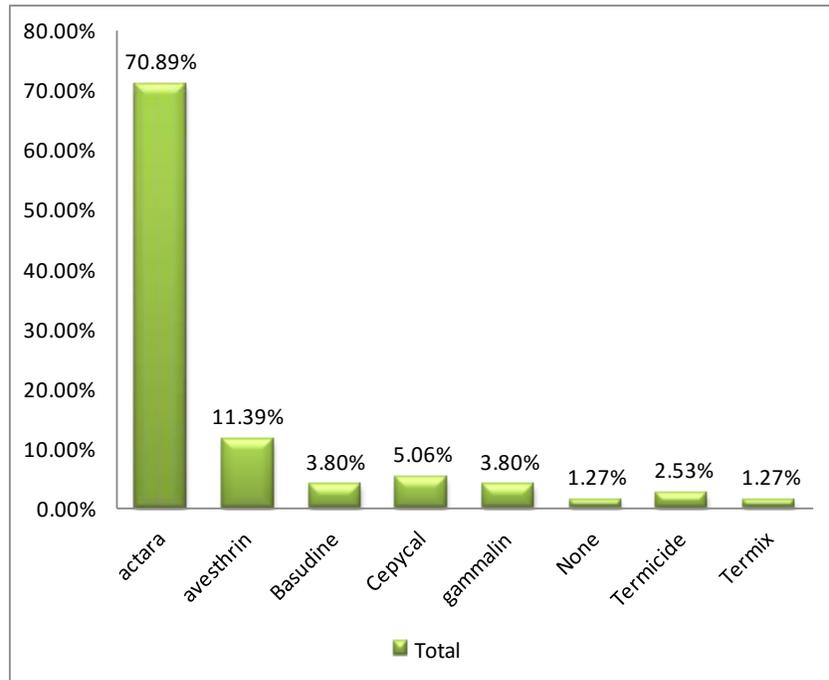
The GES component which was rolled out on 7<sup>th</sup> August, 2012 involves registration of cocoa farmers and each of them stands to benefit 50% support (i.e. subsidy) on purchase of fertilizer (*NPK 20:10:10* & *Agrolyser*) and approved fungicides (*Ridomil*, *Funguran-OH* and *Champ DP*). However, the farmers are expected to pay their 50% balance of the costs of these chemicals before collection at their nearest Farm Service Centres.

Phase 2 of the GES which will contain insecticides will be rolled out in November/December this year. It is hoped that this new programme will address most of the current challenges militating against effective integrated crop and pest management in Nigeria, if implemented with the desired funding, commitment, openness and transparency.

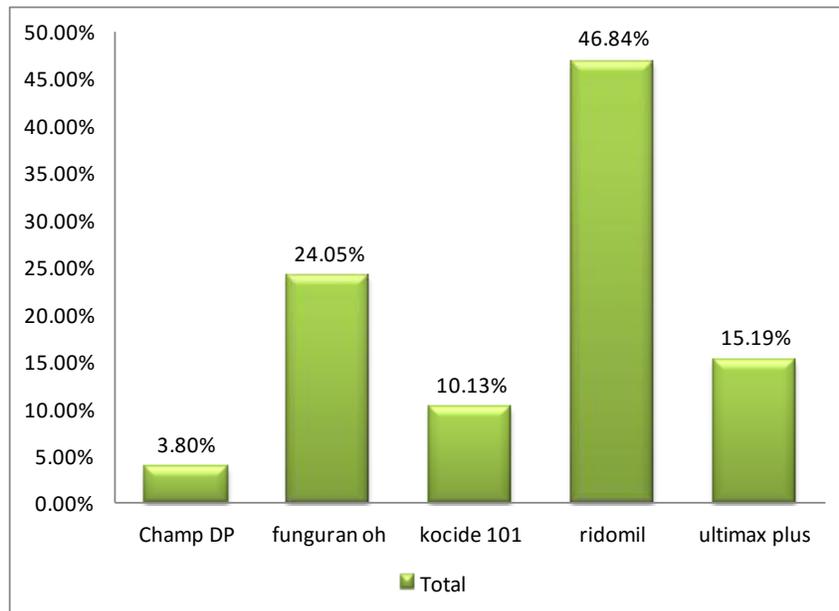
The open market where farmers buy directly from agro-inputs dealers is characterized by different approved, adulterated, unapproved, smuggled, banned and expired chemicals. The main focus here is “affordability” and “availability” rather than potency and safety. The most virile market for these chemicals was found in Ibadan (capital of Oyo state of Nigeria). Chemicals here are usually re-packaged in accordance with the price which the farmer is willing to pay or in competition with smuggled chemicals (particularly very cheap *Ridomil Gold*, *Funguran OH* and *Ultimax Plus* smuggled into Nigeria from Ghana). This study actually found some of these unapproved, banned and obsolete chemicals such as *Cepycal*, *Basudine*, *Termicide*, *Termix* and fake “*Gammalin 20*” being used by cocoa farmers particularly in Ikom in Cross River State of Nigeria as shown in Figures 3 and 4 below.

This study also confirmed that most of the banned, obsolete, expired and environmentally aggressive agro-chemicals found in the open markets were brought into Nigeria by unregistered importers who are not members of CropLife Nigeria.

**Figure 3: Types of Insecticides Used in Cocoa Production by Farmers**



**Figure 4: Types of Fungicides used by cocoa farmers**



#### **4. SERVICES PROVIDED BY IMPORTERS TO FARMERS**

The minimum academic requirement set by NAFDAC for agro-input dealership in Nigeria is the National Diploma in Agriculture. Consequently, all the agro-input importers in Nigeria

have been employing holders of either B.Sc or HND Agriculture with specialization in Agronomy as their Technical Representatives as shown in Appendix 3(b).

Furthermore, all the Importers (with CRIN-approved products) are registered members of CropLife Nigeria which is the Umbrella body for registered agro-chemical importers in Nigeria. This Association is also a corporate member of CropLife International which is a global federation representing the plant science industry. It is an Association which is involved in promoting approaches that enhance sustainable agriculture in the interest of farmers, consumers and the environment.

This study confirmed that members of CropLife Nigeria have been benefitting from the “Train-the-Trainer Programme” (TOT) of CropLife International to train the staff of member companies. They in turn train agro-input dealers and agents in the areas of product knowledge, safe and responsible use of pesticides, pesticide residues, integrated crop and pest management and good agricultural practice, as well as field trial tests, equipment handling and effective sales/marketing. It was confirmed that Consultants from CropLife International train the Staff of the manufacturers' representatives as facilitators of the Country Training Programme of CropLife Nigeria on an annual basis as shown in Appendix 3(b)

## 5. EFFECT OF COUNTERFEIT/UNAPPROVED PRODUCTS FOR THE CONTROL OF PATHOGENS

Brand loyalty is practically non-existent among cocoa farmers in the use of pesticides. Even more disturbing is the presence of unapproved pesticides in most cocoa producing communities across the country.

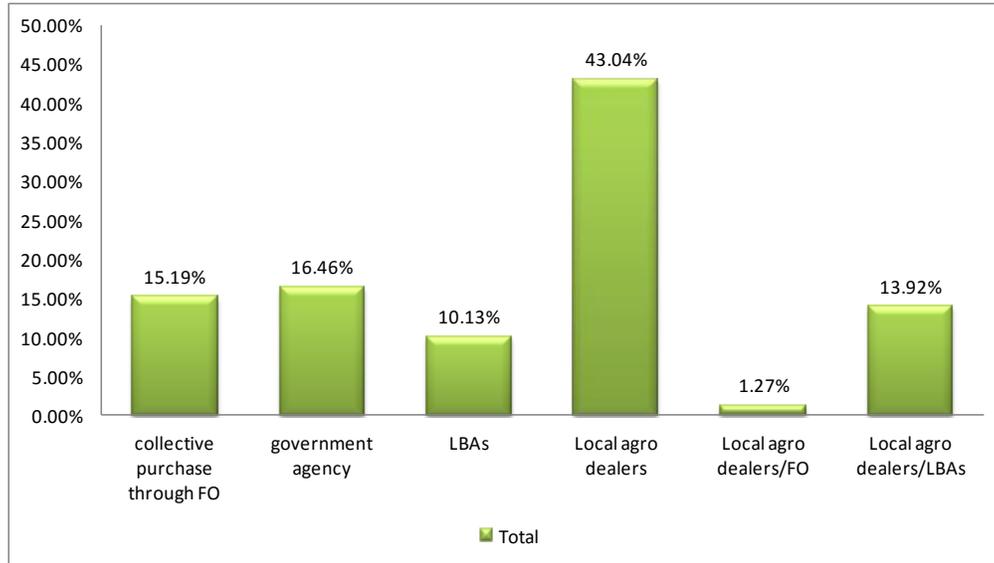
This study found that farmers use pesticides which are available and affordable, most of them relying on local input dealers (43.04% of the study sample) who themselves sell only what is popular and cheap, even when such are banned or unapproved as shown in Figure 5 below. Furthermore, it was found that the cost of unapproved pesticides (but bearing similar names) is usually much lower than approved pesticides. For example, the price of fake Actara was found to be as low as NGN80 or \$0.51 per sachet in Ikom, Cross River State.

**Table 1: Average Prices of Pesticides**

State	Average price of fungicide per sachet (50g)		Average price of insecticide per sachet		Average price of herbicide per litre	
	\$	NGN	\$	NGN	\$	NGN
Cross River	1.17	184	4.72	750	7.40	1166.67
Edo	1.41	222.14	0.95	150	6.76	1066.67
Ondo	1.26	199.33	0.93	147.33	6.28	990
Osun	1.40	220	3.09	488	6.69	1054.54
Oyo	1.48	233.33	3.68	578.57	6.54	1031.81

Exchange Rate: \$1: NGN157.74

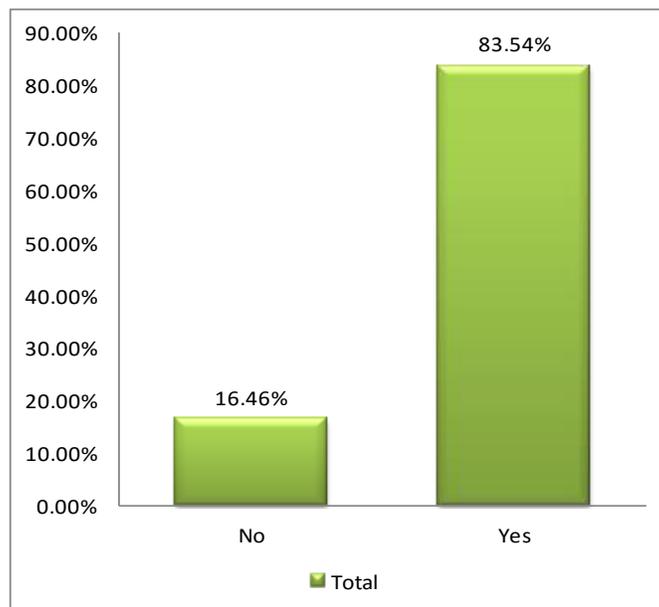
**Figure 5: Sources of Pesticides**



Poor record-keeping by farmers inhibited proper assessment of the impact of pesticides in cocoa production generally, as well as the effectiveness or otherwise of counterfeit/unapproved products for the control of pathogens. Respondents were off-handed about the effect of pesticides on production, crop quality and yield.

Though most farmers (83.54%) indicated that they were satisfied with the pesticides they used as shown in Figure 6 below, they did not provide empirical evidence to support such claims. This is a major challenge for further investigation.

**Figure 6: Farmers Satisfaction from Pesticide Usage**

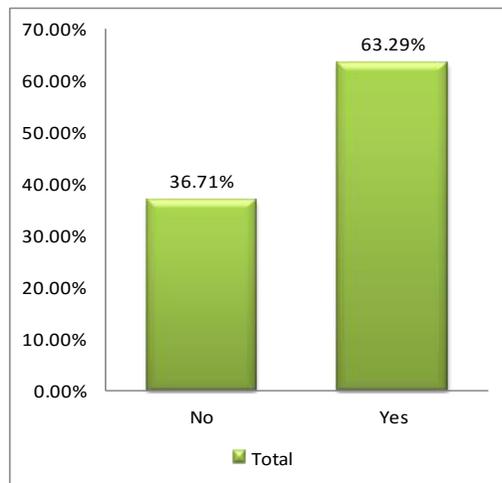


This study also found yet-to-be-approved pesticides/herbicides which were already on sale at the farmgate (for example, *Avesthrin* and *Delsate*) as shown in Appendix 2(a). The efficacy of such products is often attested to by farmers but equally without any supporting evidence.

### **COST OF APPROVED PRODUCTS AT THE FARM GATE**

The study found that there is no consistent pricing regime at the farm gate for any product for a significant period. Although most farmers (63.29%) claim that the pesticides were always available as shown in Figure 7 below, prices depended mainly on the source of supply - local agro-input dealer, Farmer's Organizations, Coops, government agency or LBAs as shown in Figures 5 (above).

**Figure 7: Availability of Pesticides**

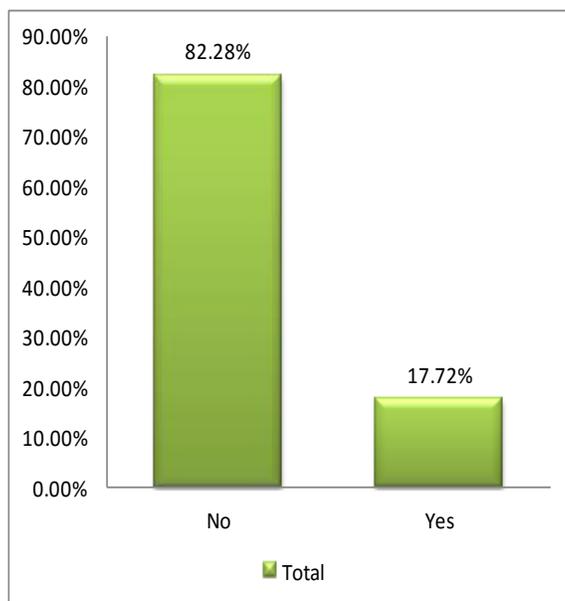


There is also a high presence of "Not-for-Sale" products of the Ghana Cocoa Board in many cocoa communities. This is relevant to fungicides and insecticides mainly.

Therefore, prices are not fixed; very high in most cocoa communities; with little subsidies present and available to a little percentage of the farmers (from 0% in Osun State to 11.39% in Ondo State) as shown in Figure 8 below and Appendix 4 (i).

On the average, price of approved fungicides range from \$1.17 - \$1.48 per 50g sachet and \$0.93 - \$4.72 for insecticides of 50g sachet. Herbicides are sold at an average price of \$6.6 per one litre at the farmgate as shown in Table 1.

**Figure 8: Accessibility of Subsidized Inputs**



## **6. IMPACT OF AGRO-INPUTS APPLICATION ON IMPROVEMENT OF FARM-LEVEL YIELDS IN NIGERIA**

This study confirmed the absence of reliable records by cocoa farmers in Nigeria. Most farmers interviewed sold their cocoa beans as the need for cash expenditure arose or in response to social pressure (like cocoa bean thieving) without corresponding correlation with yields, cost of production and cost-effectiveness of chemical control of pathogens in their farms

Most farmers who had been trained on record-keeping under the Farmers Field School (FFS) and Farmers Business School (FBS) programs have abandoned the lessons at the end of the training and intervention cycle. They do not seem to appreciate the need for continuous record keeping of their costs and sales - money in, money out (FBS slogan).

## **7. RECOMMENDATIONS ON INTERVENTION FOR AFRICAN COCOA INITIATIVE**

The current efforts of the Government of Nigeria under the Cocoa Transformation Agenda (Growth Enhancement Support) may address the observed constraints of non-availability of pesticides at the appropriate time, quality and price, issues concerning poor distribution, weak regulatory measures, illegal trade, influx of adulterated and unapproved products and lack of structured credit support to cocoa farmers. It is too early to comment on the efficient, effective and transparent implementation of the GES programme since it is still in the zero year as shown in Figure 8 on subsidized inputs. Therefore, a private sector driven

monitoring and evaluation of the programme could be very helpful at nurturing it to a fruitful and exemplary maturity.

However, one major constraint encountered during this study, which may militate against the achievement of the desired results from the GES intervention is the rigid adherence of cocoa farmers to age-long, traditional farming practices and dislike for technology uptake.

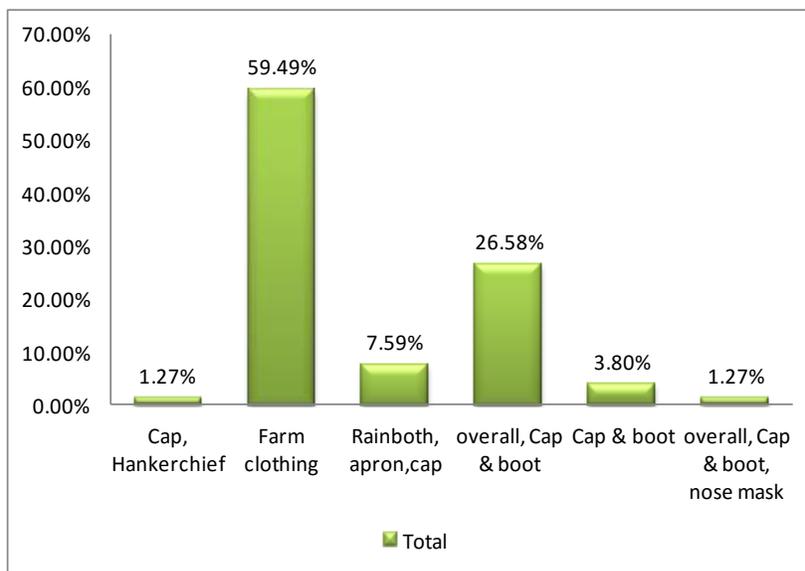
Consequently, cocoa farmers and other stakeholders in the value chain will benefit tremendously from the intervention of the ACI programme on training (for new entrants) and retraining (for graduates of FFS and FBS) on safe and rational use of pesticides and GAP.

Carefully-timed and purpose-designed extension programmes (including sensitization meetings on illegal pesticides) could engender a change of behaviour by cocoa farmers such that a significant and measurable improvement on compliance with the latest international safety standards on the use of pesticides would be achieved.

Cocoa farmers in Nigeria seem not to be aware that if pesticides are not handled and used in accordance with manufacturers' recommendations, they may become very harmful to them and consumers of cocoa products, animals and the environment. A joint action of the public and private sectors using a participatory approach with emphasis on training-of-trainers as a "**safe use initiative**" within the context of integrated pest management and working in partnership with other stakeholders in the cocoa supply chain should facilitate achievement of the desired goals of responsible, safe and efficient use of pesticides in cocoa farming.

Figure 9 below shows that only 1.27% of farmers interviewed wear appropriate clothing, caps, nose masks, etc. when spraying these pesticides. Majority (59.49%) wear their usual farm clothing when spraying agro-chemicals. It is therefore not surprising that many of them complained about skin irritation after spraying. Furthermore, used containers, which are expected to be disposed off in a proper manner, were found on the farms.

**Figure 9: Use of Protective Clothing**



In view of the foregoing, there is an urgent need to revise and translate available manuals on handling and safe use of pesticides into **local dialects** backed with aggressive media campaign, using broadcast on radio and television during the spraying seasons. This could provide the necessary guidance and instill ethics of correct and safe use of pesticides among cocoa farmers and retailers.

Furthermore, the WCF may consider training of farmers on simple and sustainable record-keeping methods which can be verified on regular basis by experts from WCF and other stakeholders.

Access to credit is a major challenge to farmers; hence the WCF-ACI project could well consider options for easy access to credit through international funding, grants and low interest rate loans for cocoa production. This will promote timely procurement of approved pesticides and correct usage at the right time.

Hopefully, the above mentioned interventions should provide the surest guarantee for the production of cocoa in Nigeria with the desired quality and aroma, as well as safety of all stakeholders and environmental protection.