

# **THE EXPORT CROP SECTOR IN NIGERIA**

## **Introduction**

Prior to liberalization, the overall objectives of trade policy in Nigeria included a Marketing Board Policy (1960-1977) through which all exportable agricultural products were purchased by the Government at prices far lower than world prices, and incentives were given to farmers to increase their acreage and adopt some imported technologies (Okuneye, 1985). Commodity Marketing Boards were established in 1977 by the Federal Military Government to take care of specific crops such as cocoa, rubber, roots and tubers, etc. Food imports were limited, but crop production for exports was intensified during the period of liberalization.

The Structural Adjustment Programme period 1986–1993, especially trade liberalization, enhanced export prices partly due to the devaluation of the Nigerian currency. This led to higher levels of output of many crops primarily destined for the export market.

The rapid growth in exports that followed large and successive devaluations necessitated a study of the environmental impacts of trade expansion, using the main export crops, cocoa and rubber as case studies. In general, average figures for the period 1993-1995 show that cocoa, rubber, fish and shrimps, and cotton were the major agricultural commodities being exported from Nigeria. Cocoa increasingly accounted for the largest percentage of non-oil exports in Nigeria. Both cocoa and rubber still remain the largest non-oil exports from Nigeria. The expansion of these exports has, however, not been neutral to the environment. This report investigates the specific effects of export expansion on the environment and the social sector. Additionally, the report attempts to quantify some of these effects and specifically evaluate policy options that would mitigate some of the negative effects.

## **Agricultural trade and the environment: SAP and trade liberalization in Nigeria**

A major component of SAP was the diversification of the export base away from oil and the expansion of non-oil exports, especially agricultural exports. The liberalization policy environment under Nigeria's SAP was initiated principally to support the agricultural sector in general, and agricultural exports in particular.

Specific trade liberalization measures undertaken under SAP included the removal of bureaucratic controls on trade. The import licensing system, together with exchange control on all current transactions was abolished as soon as exchange liberalization began in September 1986. In addition, commodity-marketing boards were abolished. The number of prohibited imported items was drastically reduced.

Export prohibitions were abolished for most items. In 1987, a new export finance facility was introduced by the Central Bank. A financing and rediscounting facility to assist private exporters by providing refinancing for the export of both agricultural and non-agricultural products was introduced. In 1987, a duty drawback/suspension scheme was introduced to enable exporters to import raw materials and intermediate products for use in the manufacturing of export products.

While export promotion policies were primarily intended to move Nigeria away from a dependence on primary commodities, cocoa beans, rubber and palm kernel provide more than 70 per cent of Nigeria's non-oil export earnings. Thus commodity market instability, as well as unfavourable terms of trade were experienced to different degrees by Nigeria. Specific export promotion policies included successive devaluation of the Nigerian currency, which improved the export competitiveness of the cocoa and the rubber sectors.

In order to achieve the SAP objective of diversifying the export base of the economy, Nigeria adopted a liberalization policy, which was anchored on a number of important macro and meso economic policy initiatives. At the macro level, a deregulated exchange rate market was a prime policy instrument, while at the meso level, a liberalized trade policy regime and the development of a workable rural (agricultural) infrastructure and efficient markets were the keys to the success of SAP.

### **Environment policy in Nigeria**

Export expansion had an effect on the environment of the Nigerian economy which could be mitigated by the policies being pursued. The analysis of government policies aimed at environmental protection and natural resource utilization derives from information from the Development Plan documents (1<sup>st</sup> - 4<sup>th</sup> Plans and the Rolling Plan) and from the document on the National Policy on the Environment.

These documents indicate that environmental policies as far as the trade sectors were concerned, consisted of soil conservation measures aimed at wind and water erosion. Projects that had relevance for environmental protection were, however, subsumed under the 'Agriculture' and 'Town and Country Plan'. More specifically, relevant projects under agriculture were initiated under agricultural infrastructure. There were also anti-drought measures. Specific soil conservation measures included contour bounding, terracing, check damming and drainage systems. Anti-drought measures included tree planting and afforestation projects and the establishment of shelter-belts.

### **Trade growth in Nigeria**

Between 1962 and 1968, Nigeria's major foreign exchange earner was the agricultural sector. However, even though trade was liberalized during this period, agricultural exports declined and the sector did not benefit from the relaxed trade environment. Thus the kind of liberalization at that time (which favoured import substitution and consumption of foreign made goods), reduced the threat that an expanding agricultural exports sector may have had on the environment.

Restrictive trade policies began to emerge between 1976 and 1978, and intensified in the period between 1978 and 1980. These included such policies as :

- general ban on non-essential imports, especially food imports;
- tariff increases on some items;
- new duties on certain items not hitherto taxed;
- imposition of compulsory advance deposit on some classes of imports;
- industrial raw materials which were previously under open general license were placed under specific import license;
- export bans were imposed on certain items;
- export tariffs were reviewed upwards for some other items;
- centralized marketing of agricultural products was reinforced through the formation of Commodity Boards which handled specific crops.

Again there was no specific linkage between environmental policies and trade policies during this period. Environmental policy statements in the plan were not based on any kind of empirical findings or policy analysis.

Trade reforms in Nigeria's agricultural sector were aimed at expanding the export capacity of the sector through increased domestic production of export crops, increased domestic production of tradable semi-manufactured goods from agricultural raw materials, increased import of agricultural inputs such as fertilizers, agrochemicals, farm implements, farm power, and increased import of agro-industrial inputs, and finally a relative increase in resource allocation from non-tradable to tradable crops in agriculture.

This period of trade liberalization was accompanied by a sizeable boost in the agricultural sector. However, the period also witnessed a better-packaged environmental policy agenda. Notwithstanding this development, environmental policy formulation did not have a direct link to considerations regarding the consequences of trade liberalization policy. A national policy on environment that encouraged land-use and soil conservation and a more rational use of agricultural chemicals, was introduced perhaps as a result of the general increase in awareness related to the Rio Summit.

## **Integrated assessment of trade liberalization**

### **Environmental impacts**

Trade liberalization policies as they affect agricultural commodities, often bring about the tendency to concentrate on the increase in economic returns through increases in production and output prices. This section examined the impact of trade liberalization on the soil resources through the assessment of soil degradation processes

such as loss of topsoil, terrain deformation, loss/excess of nutrients, acidification and soil compaction and pesticide residue.

Characteristically, the land for the growth of export crops such as cocoa, rubber and palm oil are in general carefully chosen. The loss of nutrients and organic soil matter usually occurs frequently under low-input agricultural systems practiced in Nigeria on poor or moderately fertile soils. The total nitrogen (N) content also compares well, with medium values for mineral soils, except in Abia and Cross River States, which possess higher values. The nitrate-nitrogen ( $\text{NO}_3\text{N}$ ) values of the surface soils of cocoa (1.70 to 37.54  $\text{mg kg}^{-1}$ ) were within low to medium range levels for soils. Since the farmers claimed that they did not apply fertilizers, the source of the high  $\text{NO}_3\text{N}$  values in these soils could be traced to the mineralization of the high organic matter of the cocoa soils in that state. The concentration of phosphorus (P) in Ogun State cocoa soils, was very high. The nutrient contents of soils under rubber crops followed the same trend as in cocoa soils. The values of available phosphorus in rubber soils are high to very high except in Cross River State where the values are extremely low.

The effluents from the rubber-processing factories contained higher concentrations of phosphate, potassium, zinc and total petroleum hydrocarbons than the stream water samples.

A mean of 1.83  $\text{ppm}^1$  (range 0.49 to 2.34 ppm) nitrate ( $\text{NO}_3$ ) was obtained for streams in or near cocoa farms. The adjacent stream to a rubber-processing factory contained 6.62 ppm  $\text{NO}_3$ , that is about three times the nitrate concentration of streams near the cocoa farms.

The sodium (Na) content of effluent samples (mean = 0.32 ppm; range 0.05 to 0.47 ppm) was observed to be lower than that of the stream water samples in or near cocoa farms (mean = 9.40 ppm; range 1.31 to 16.46 ppm). A value of 7.73 ppm of potassium was obtained for the adjacent stream near the rubber-processing factory.

This clearly shows that the trade liberalization policy has not resulted in any metal pollution of surface waters in the study area.

The effluent samples from the rubber-processing industries showed a slightly high concentration of total petroleum hydrocarbon (mean = 27.17 ppm) when compared to the results obtained for the stream water samples (8.88 ppm). The mean result obtained for the effluent samples is higher than the FEPA's effluent limit -20 ppm (Osibanjo, 1996) for discharge into surface waters. The results of water analysis show that there were trace concentrations of nitrate, phosphate and metals in the water samples obtained from the study area. Consequently, the present farming systems can still accommodate the use of higher levels of agrochemicals.

---

<sup>1</sup> Parts per million.

### **Economic impacts**

The average annual cocoa output in Nigeria fell continuously during the pre-SAP period and witnessed an increasing trend in cocoa output in the post SAP period.

Rubber output was about constant in the pre-SAP and it recorded an upward trend in the post SAP regime. The rise, which was still very small was, however, increased sharply in the SAP policy period. **This shows that SAPs had serious effects on rubber and cocoa output in Nigeria.**

### **New areas planted to cocoa and rubber in Nigeria**

This sharp increase soon gave way to a sharp decline in new plantings to cocoa during the SAP period as farmers took care of all their existing cocoa farms. **These figures do not represent all the cocoa trees planted in Nigeria during the reference periods.** However, authoritative sources from the National Tree Crop Development Unit (NTCDU) in Benin city, Nigeria, puts the figures released as representing about 90 per cent of new cocoa plantings in Nigeria. This implies that about 90 per cent of the increase in acreage of cocoa could be attributed to the cultivation of abandoned farms.

For rubber, the average annual new plantings in the post SAP period was far more than was obtained in the SAP period. The reason for this is that farmers intensively tapped (slaughtered-tapped) during the SAP period to obtain the highest return consequent to improved prices, and hence plantings took place post SAP to replace the destroyed trees.

### **Agrochemical use**

Insecticide importation, on the other hand, declined sharply in the SAP policy period and stabilized. Fertilizer imports rose consistently over the pre-SAP and post SAP policy periods. The rise from period to period was progressively sharper.

However, it is very clear from the results obtained in this study that pollution of the surface water as a result of trade liberalization has not occurred, at least not on a persistent basis, given the number of years SAP was in operation. This confirms the information provided by the tree crop farmers at various RRA meetings. They claimed that they have not been using fertilizers and pesticides on their farms. This was mainly due to the prices of the agrochemicals, which were high relative to the prices of cocoa and rubber. Any effort to subsidize the prices of agrochemicals may result in over-use. The danger of excessive agrochemical use can be countered by proper advisory services on its use.

## Input-output responses to trade liberalization policies

### Exports/agricultural exports ratio

The average annual value of cocoa exports to agricultural exports ratio increased in the 1974-1979 policy period relative to the 1970-1973 period (0.49 to 0.82). SAP policies, however, resulted in a significant decline in the ratio from 0.89 to 0.68. The decline continued in the post SAP period to about 0.42. The average annual cocoa output declined significantly in the 1974-1979 period relative to the 1970-1973 period. The trend is similar for the 1980-1985 period relative to the 1974-1979 period, but rose significantly in the 1986-1993 period relative to the 1980-1985 period, and insignificantly in the post SAP relative to the SAP period.

In the SAP period, the rubber sector experienced a significant increase in the average annual output, which stood at 202.5 thousand tonnes relative to 80.7 thousand tonnes for the preceding policy period (1980-1985). The increase experienced in the post SAP period was however not statistically significant.

### Input responses

The insignificant increase and outright decreases in agrochemical imports in the SAP and post SAP periods may have resulted from the drastic decline in the demand for agrochemicals by farmers due to the substantial relative increases in prices of these inputs on account of devaluation. The farmers (cocoa and rubber) stated that most of them would not return to the use of fertilizers unless the prices fall back to between ₦ 200–₦ 500 per 25kg bag. According to cocoa farmers, 1 tonne of cocoa, which sold for ₦ 100,000 in 1994/95 now, sells for about ₦ 70,000 (Rapid Rural Appraisal, September 2000).

**Farmers stated that they still believe that agricultural inputs are important for increasing output.** It is important to note that the National Policy on Agriculture during the SAP and post SAP periods emphasized self-sufficiency in food production. Even so, the increased trading activities during the SAP period favoured practices such as adulteration of both inputs and outputs in the export sector.

### New areas planted to cocoa and rubber in Nigeria

The second implication of the increased production of export crops in the post SAP period relative to pre-SAP is the loss of biodiversity and degradation of soil through expansion of hectares cultivated. The average annual new hectare plantings to cocoa actually declined in the SAP and post SAP period relative to the pre-SAP period, implying that farmers concentrated more on maintenance of existing farms, with new farms increasing at a decreasing rate during the periods under consideration.

Available secondary data seem to support the conclusion that the average annual expansion in hectares planted to cocoa and rubber in the post SAP period were respectively lower than that of the pre-SAP period for cocoa and not different from that of pre-SAP for rubber.

### Impact on farm size

Survey data analysis shows that male farmers, representing 97.1 per cent for cocoa and 92.86 per cent for rubber, predominantly produced the two crops. About 26 per cent of the cocoa farmers have non-farming activity as their main occupation. The figure is 19.44 per cent for rubber growers. Those with more than primary education were 19.7 per cent for cocoa and 12.5 per cent for rubber.

The average cocoa farm size increased from 4.35 hectares in 1985/86 to 4.50 hectares in 1992/93 and to 4.53 hectares in 1999/2000. The total farm output of the average farm increased from 2.19 tonnes in 1985/86 to 2.80 tonnes in 1999/2000. The farm size and levels of output therefore responded positively to trade liberalization policies.

### Output response analysis

In general, the price of fertilizer relative to the output prices declined from 1985/86 (0.141 for cocoa and 0.18 for rubber) to 1992/93 (0.027 and 0.12) but rose sharply in 1999/2000 (0.413 and 1.78 respectively). Pesticides were not used in small-scale rubber farms.

The elasticity coefficient for the response of cocoa output to increase in farm size was 0.66 in 1985/86 (pre-SAP period), 0.51 in 1992/93 (SAP period) and 0.56 in 1999/2000 (post-SAP period). The output price elasticity coefficient estimate was not significant at the 5 per cent level for all three periods. Thus cocoa output did not respond significantly to price changes. Secondly, the result implies that liberalization did not alter the existing situation of low responsiveness of cocoa output to price increases. The elasticity coefficient of cocoa output response to pesticide use is 0.46 for the pre-liberalization period, but rose to 0.77 and 0.85 in the SAP and post SAP periods.

The report shows that the most important factor in the determination of pesticide demand in cocoa production in the pre-liberalization period are cocoa farm size and age of cocoa trees. That is, 0.96 for farm size and 1.09 for age of trees. During this period, cocoa and pesticide prices did not play much role in pesticide demand. In the post-liberalization period (SAP and post SAP periods) however, the price of pesticide became a significant factor in the determination of pesticide use in addition to farm size.

*The prices of agrochemicals have played a significant role in the low response of output in the export crop sector to trade liberalization in Nigeria. Thus it can be said that the effects of trade liberalization on the environment through the export crop sector could have been greater if input prices had not increased relative to output prices.*

### Impact on profitability

The report shows that the profitability ratio for the SAP period was higher (5.67 and 5.09 for cocoa and rubber) than the pre-SAP and post SAP periods, which were

1.46/4.32 and 3.41/1.65 respectively for cocoa and rubber. Generally, profitability was seen more in cocoa farms than in rubber farms, especially in the post SAP period. This is largely due to the sharp decline in rubber prices in the post SAP period.

## Valuation of trade liberalization

### Economic valuation

The gross margin can be estimated to be ₦ 40,890 x 1,000,000 = ₦ 40.89 billion which can be assumed to be the economic benefits from cocoa. Also rubber contributes ₦ 2, 029 x 236,000 = ₦ 0.478 billion. The total is ₦ 41.37 billion. If the possible increases in output arising from improved management and environmentally suitable practices are sustainable, as pushed by the Institutes, these could lead to about 50 per cent rise in economic benefit i.e. ₦ 41.37 x 1.50 = ₦ 62.055 billion.

*It is observed that at a 35 per cent discount rate, the net present values (NPV) and benefit-cost ratios are lower than those at a 10 per cent discount rate for both cocoa and rubber. The summary of the results of the sensitivity analysis presented in the report show that if cost should increase by 30 per cent, both cocoa and rubber production will not be profitable at 35 per cent discount rate except when rubber is 'slaughter' tapped.*

### Environmental costs

A scenario can be established in which, given the interest of the Federal Government of Nigeria (now a democratic government) in agriculture, some incentives including price subsidies may be put in place. This high possibility could lead to:

- increased use of pesticides
- higher level of demand for fertilizer
- expansion of cocoa and rubber hectareage.

These assumptions are hinged on the premise that civilian governments often yield to pressures for agricultural support more than the military governments. The second reason is that there is a greater need for foreign exchange earnings in Nigeria than before, and hence greater incentives could be given to the Nigerian farmers that will also enhance farmers' income.

*The totality of these possibilities is that there could be increased acidification of the soil, significant soil degradation, and water pollution with attendant adverse consequences on the flora, fauna, aquatic and human beings.*

The actual cost implications in terms of capital and recurrent expenses for high producing states for five years may be difficult to determine, but should be in the neighbourhood of the figures stated below:

ITEMS	Capital costs (₦'million)	Recurrent costs (₦'million)
• Effective monitoring	25	67.5
• Capacity building	--	368.5
• Publicity and enlightenment	--	180.0
• Research and popularisation of cocoa pod husks	5.0	50.0
• Product development and marketing arrangement		37.5
• Extension/mobilization/environmental issues		25.5
• Pilot scheme on integrated pest management	--	150.0
• Logistics, meetings, travels, etc.	7.5	10.0
	--	--
Total	37.5	889.0
<b>Grand Total</b>		<b>₦926.50 million</b>

### Social valuation

This is based on estimates of the cost of curing adverse health effects that populations could be subject to on account of higher pesticide usage. Out of the 22 million export crop producers, 10 per cent could be said to suffer from skin ailments i.e. 2.2 million. As palm oil, costing ₦ 60/bottle is normally used for skin ailments, a crude estimate based on the assumption that each person uses up to half a bottle of palm oil, works out to ₦ 30 x 2.2m = ₦ 6.6 million.

### Net impacts

The net impacts could be estimated by comparing the existing benefits and potential costs. The economic benefits are actual based on revenues and discounted at 10 and 35 per cent, whereas both the environmental and social costs are potential.

**Estimated net impacts (monetary)**

	Benefits (₹ 'billion)	Costs (₹ 'billion)	Net benefits (₹ 'billion)
Environmental	20.1103	8.3206	11.789
Economic	62.055		62.055
Social	6.6	6.6	-
Net impacts			73.844

**Policy package**

In order to mitigate the identified negative impacts, the following steps are necessary:

- There should be a control mechanism to advise on and monitor the rate of expansion of export crop farms, giving incentives to the replanting of old trees so as to dissuade farmers from unprofitable and environmentally degradable practices.
- There should be an effluent charge on pollutants arising from the activities of rubber processing industries to minimize or eradicate the untreated petroleum hydrocarbon generated by their factories.
- A Farm Development Advisory System (FDAS) should be evolved to advise non-producers of cocoa and rubber on appropriate environmentally friendly profitable enterprise combinations of new/other exportable crops that can raise their incomes and minimize income disparities in communities and among genders.
- Health centres should be established in cocoa and rubber producing areas, to assist in the treatment of ailments, and include a good community health division to provide advice against the dangerous misuse of agrochemicals such as treating tooth-ache or stomach-ache ailments and the like.
- There is a need to revert to the establishment of a supervisory marketing agency that can monitor the sale and promote the production of cocoa and rubber in an environmentally friendly manner, and oversee the supply and use of only appropriate and unadulterated agrochemicals. This body could be 'quasi-government', with substantial representation from cocoa and rubber producers' associations, researchers and financial institutions.
- There should be a product development and marketing programme on the use of dried cocoa pod husks (so as to avoid the inoculum causing black pod disease), which can be used as raw materials for traditional soaps, manure and livestock feed.
- Conservation and rehabilitation programmes should be organized in areas where degradative processes are about to set in. Also, uncontrolled felling of rubber trees should be checked and farmers encouraged, through appropriate pricing mechanisms, to replant the cleared land and rehabilitate the old rubber plantations

with disease resistant and early maturing varieties, such as those now available at the Rubber Research Institute of Nigeria, Benin City.

To enhance the positive impacts, the following are recommended:

- The Federal Government should ensure that there is only a small margin between the producer prices of exportable crops and world prices, so that farmers can benefit substantially from international trade. This will entail the propagation of market prices on a regular basis via electronic and print media in English and vernacular.
- The Government should legislate on the processing of cocoa beans to increase the value added and generate employment opportunities at the grassroots level.
- There should be increased government support for agriculture through the construction of rural roads, rural electrification, development of seed and fruit nurseries as well as primary and secondary schools to improve the level of literacy of the rural population.
- The Government should increase the research and training funds that concern the environment, agriculture and trade, so as to have detailed information about what is happening in these sectors on regular basis. Such research should be on disease resistant high yielding varieties in order to minimize the use of agrochemicals, etc.
- Farmers' Associations should continually enlighten their members on environmentally degrading practices through training, workshops, seminars, etc., and educate the farmers on sustainable tapping techniques in order to avoid slaughter tapping as currently practiced.

### **Plan of action**

- Organization of a National Steering/Stakeholders' workshop to present the report and enlighten the public on the findings of the study.
- To forward the recommendations of the workshop to the National Assembly for consideration and possible adoption.
- Sensitization of policy makers on the merits of the report.
- To publish the report for circulation to stakeholders and international organizations including the International Cocoa Organization, UNDP, WTO, etc.
- To organize training workshops/seminars on environmental economics to enhance the capacity building of researchers/lecturers, extension agents and leaders of Farmers Associations.
- To attend various related seminars and workshops on trade, agriculture and the environment at the national and international levels.

It must be emphasized that the estimated costs could rise by 25 per cent or fall below the projected values. In other words, the proposed policies may cost between ₦926.5 million and ₦1158.125 million

## Conclusions

This study on export crop promotion in Nigeria has raised some issues regarding the sustainability of Nigerian agriculture. The study shows that the advantages of trade liberalization should be weighed against the possible environmental and social costs of production.

The major conclusions of this study are the following:

- Export crop promotion, through trade liberalization and trade-related policies, has enhanced the contribution of agriculture to the GDP of Nigeria and raised the foreign exchange earnings of the non-oil sector.
- The high level of output for cocoa during the SAP period was due to the cultivation of abandoned farms and high output price than the use of agrochemicals. In fact, after the SAP period (1986-1993) farmers used little or no agrochemicals.
- The relatively high rubber prices during the SAP period led to ‘slaughter’ tapping, particularly after the SAP period, leading to dry rubber trees and abandonment of rubber farms.
- Whereas no form of erosion or soil loss was observed on cocoa and rubber farms, the over tapping (slaughter tapping) of rubber trees portends a dangerous opportunity for soil degradation and erosion given the absence of canopy on the rubber farms.
- Mainly because very small quantities of agrochemicals were used by farmers during the post SAP period (1994-2000), in consequence to poor output prices relative to the price of agrochemicals, the nitrate, phosphate and metal concentrations in water and soil samples were low. However, any improvement in the relative prices in favour of cocoa and rubber could lead to serious consequences in the use of agrochemicals by farmers if not properly guided and monitored.
- Export crop farmers were better off than other farmers in their communities largely due to trade liberalization. The cost-benefit analysis shows that the economy would have been better off if sustainable management approaches to the use of land had been adopted. The study has shown the weaknesses in just adopting trade liberalization without putting in place appropriate policies to guide its adoption. There is the need for a guiding and monitoring system, which would minimize the negative impacts of trade policies at the grassroots level. Such policies and programmes could be in the form of developing disease resistant and early maturing varieties of cocoa and rubber, educating and sensitizing the Farmers’ Associations and developing rural infrastructures (roads, water supplies, health

---

centres, schools, etc.). These will improve the living standards of the rural people that produce these crops.

### **Areas for future study**

One important area for future study that emanates from this work is an evaluation of the amount of agrochemicals that can be used by Nigerian tree crop farmers without leading to environment losses. This is an important task give that current levels of agrochemical use are far below the recommended rates. With a greater availability of information and a more open economy, farmers may have greater access to these chemicals in the future. It is important therefore that the safe limits be determined far ahead of such situations. The strategies to ensure that such a situation would be properly managed must be thoroughly evaluated.

Also, a close look at the fish and shrimp sector, the petroleum sector, as well as the forestry and wildlife sectors of Nigeria may well reveal significant environmental damage arising from world trade activities in these sectors. Hence, they are worthy of investigation for the purpose of capacity building and whatever other appropriate measures need to be put in place to minimize damage by other sectors.