

Agricultural Export Potential in Nigeria¹

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1.1 Introduction

Oil dominates the Nigerian economy, rising from 29 per cent of gross domestic product (GDP) in 1980 to 52 per cent in 2005. Oil and gas now contribute about 99 per cent of exports and nearly 85 per cent of government revenues, although their contribution to employment is estimated to be only 4 per cent. Agriculture, the second largest sector, fell from 48 per cent of GDP in 1970 to 20.6 per cent in 1980 and was only 23.3 per cent of GDP in 2005. Agricultural exports are negligible and represent about 0.2 per cent of total exports. Nevertheless, an estimated 60 per cent of Nigerians are employed in the rural sector. Manufacturing and services represented 4.6 per cent and 19.9 per cent of GDP, respectively, in 2005 (Table 1). Most economic activity is therefore in primary production with limited value added through processing and agribusiness.

Since 1999, Nigerian GDP has grown at an average annual rate of 3.5 per cent. The long-term growth rate has been about 2.8–3.3 per cent between 1980 and 1998. Growth has barely exceeded population growth, which has been between 2.8 per cent and 3 per cent. This trend is an indicator of the worsening poverty in Nigeria. Inflation has remained moderate thanks largely to a sustained increase in food production and the tight fiscal and monetary policy regimes of the federal government. The effects of increases in food production are lower cost of living and, consequently, lower consumer prices for manufactured products that depend on agricultural raw materials. Efforts at stimulating real sector activities have been dampened by high interest rates, poor infrastructure and import competition.

Agriculture contributes to employment, food production, foreign exchange earnings and industrial inputs. In 2001, agriculture was about 41 per cent of GDP. Some 60 per cent of the workforce is employed in agriculture, predominantly smallholders (CBN, 2002). Nigeria has a total land area of 98.3 million hectares, of which only 71.2 million hectares are cultivable. Only 34.2 million hectares (about 48 per cent of the cultivable area) are actually being cultivated, and less than 1 per cent of the arable land is irrigated (FMARD, 2001). The modest growth of between 5.5 per cent and 7.5 per cent in the agricultural sector over the period 1999–2005 has been traced to the favourable weather conditions, while services and commerce expanded, following improvements in the purchasing power of

Table 1 Structure of economy, 1974–2004 (percentage of GDP at current factor costs)

	1970	1980	1990	2000	2003	2004
Oil sector	6.0	29.1	39.3	48.2	44.6	48.2
Non-oil sector	94.0	70.9	60.7	51.8	55.4	51.8
Agriculture	41.3	20.6	29.7	26.3	26.4	16.6
Industry	7.8	16.4	7.4	4.5	4.8	8.7
Services	45.0	33.8	23.6	21.0	24.2	26.5

Source: National Bureau of Statistics/IMF.

consumers. Agricultural output has been increasing at a slow rate over the last several years, except in 2002 and 2003, when the sector grew at an average rate of about 7.5 per cent per annum.

The sector recorded moderate growth of 6.1 per cent and 6.5 per cent in 2004 and 2005 respectively. The growth of the staple crop production index has been oscillating between 3 and 3.6 per cent. All the major staples have recorded significant increases in output with the exception of maize. In spite of the decline in international market prices, cash crop production has been growing too, at least 3 per cent for cocoa, coffee and rubber between 1999 and 2004. The index of live-stock production (1984 = 100) has been rising by at least 2.4 per cent annually, while fisheries output has been rising by at least 3.6 per cent.

Empirical analyses show low and negative long-run income elasticity of demand but high long-run price elasticity of demand, such that prices rise and fall in response to the relatively high global commodity market prices. This has implications for international trade policies in the Nigerian economy. The prices of Nigeria's major agricultural export commodities were generally depressed in the international commodities market, with the exception of cocoa in the last trading season (2005/2006). The decline in commodity prices has been attributed to the slack demand and excess supply situation. Using domestic prices, the decline in prices ranged from 4 per cent for cotton to about 40 per cent for copra. Generally, domestic producer prices of Nigeria's agricultural commodities have exhibited mixed trends in the recent past (Adubi and Okunmadewa, 1999; Okoh, 2004).

There has been some recovery in a few non-traditional exports, for example cocoa bean exports grew at close to 8 per cent annually between 1999 and 2004. In addition, a few non-traditional exports, such as shrimps, have also experienced rapid growth in the last few years. Instability and very sluggish growth have characterized the output of Nigeria's dominant agricultural export commodity, a situation that typically reflects the production trend of other agricultural crops (see [Table 2](#)).

1.2 Structure of agricultural exports

In the 1950s and 1960s, agriculture accounted for 60–70 per cent of total exports. Nigeria was then a major exporter of cocoa, cotton, palm oil, palm kernel,

groundnuts and rubber. Average annual growth rates of 3–4 per cent were achieved for agricultural and food crops. Government revenues depended heavily on agricultural export taxes, and both the current account and fiscal balances depended to some extent on agriculture. Between 1970 and 1974, agricultural exports as a percentage of total exports fell from about 43 per cent to slightly over 7 per cent. From the mid-1970s to the mid-1980s, the average annual growth rate of agricultural exports declined by 17 per cent. By 1996, agriculture accounted for only 2 per cent of exports. As agricultural exports shrank from the traditional 12–15 commodities of the 1960s, Nigeria became a net importer of some commodities that it formerly exported. Also, the market for Nigeria's agricultural exports did not increase appreciably as roughly all of it still goes to the European Union, and almost in its primary form without any appreciable value addition.

The major cause of the decline in agricultural exports was the oil price shocks of 1973–74 and 1979, which resulted in large inflows of foreign exchange and neglect of the agricultural sectors ('Dutch disease'). The consequence of this phenomenon was that, owing to the reduced competitiveness of agriculture, Nigeria began to import some of those agricultural products it formerly exported and other food crops that it had been self-sufficient in. For example, between 1970 and 1982, Nigeria lost over 96.6 per cent of her exports in nominal terms. Domestic food production also declined substantially, causing the food import bill to attain a high of about \$4 billion in 1982. The astronomical increase in imports was financed by oil revenues, which ensured positive current account balances in 1979 and 1980.

By 1986, the situation had reached crisis stage, dramatizing the ineffectiveness of the policy of industrialization through import substitution. This strategy, conferring protection on import-competing manufacturing by imposing high duties on finished imports and low duties on raw materials and intermediate goods, taxed the exportable goods (agricultural) sector of the economy so that, by the time the oil market crashed, many manufacturing concerns could no longer operate because of lack of foreign exchange to import raw materials.

One consequence of the failure of this policy regime to cope with the negative oil price shock was its substitution by an outward-looking external policy stance under the Structural Adjustment Programme (SAP) introduced in 1986. Under the SAP, the emphasis was on diversifying Nigeria's export base away from oil and increasing non-oil foreign exchange earnings. To achieve the objectives of the programme, the government put in place a number of policy reforms and incentives to encourage the production and export of non-oil tradable goods as well as broadening Nigeria's export market.

As presented in [Table 2](#), the major agricultural exports produced in Nigeria consist of cocoa beans, rubber, fish/shrimp and cotton. While agricultural produce accounted for 33 and 42 per cent of total income from non-oil exports in 2004 and 2005, respectively, processed agricultural products accounted for 49 and 41 per cent. Consequently, the agricultural sector can be said to have contributed 81.9 and 82.3 per cent in these years. Income from agricultural products in 2005 grew by 2.8 per cent over the level of 37,532.6 million naira to 38,567.4 million naira. Earnings from cocoa beans, fish/shrimp and 'others' increased by 47.7, 3.1

Table 2 Trend of agricultural export performance in Nigeria, 1970–2005

Year	Volume of agricultural exports ('000 tons)	Value of agricultural exports (million naira)	Index of agricultural production (1985 = 100)	Agricultural share in total export earnings (%)	Share of agriculture in non-oil export (%)	Share of agriculture in GDP (%)	Nominal exchange rate
1970	1,087.0	265.2	126.0	29.7	70.9	41.3	0.7
1971	779.3	242.8	114.2	18.1	66.7	35.9	0.7
1972	870.0	172.0	94.0	12.0	68.6	31.5	0.7
1973	1,094.7	250.1	102.2	10.5	68.8	27.6	0.7
1974	789.6	276.0	118.7	4.5	64.2	27.5	0.6
1975	527.0	230.6	104.3	4.5	65.9	25.5	0.6
1976	566.6	274.1	97.6	4.3	64.4	22.3	0.6
1977	407.1	375.7	96.7	4.7	71.8	22.4	0.6
1978	287.6	412.8	93.5	6.2	65.8	21.9	0.6
1979	306.2	468.0	92.4	4.6	69.8	19.2	0.6
1980	240.7	340.1	192.5	2.4	61.3	23.4	0.5
1981	127.4	178.4	95.2	1.6	52.0	34.8	0.6
1982	182.9	198.6	98.3	2.4	97.7	35.75	0.7
1983	222.2	431.2	93.9	5.7	72.6	37.6	0.7
1984	157.7	208.8	100.0	2.3	84.4	49.4	0.8
1985	166.1	259.8	104.6	2.2	52.3	40.3	0.9
1986	242.8	407.4	108.3	4.6	73.8	42.8	2.0

1987	332.5	1,588.5	116.1	5.2	73.8	41.8	4.0
1988	497.4	1,780.4	138.5	5.7	64.6	41.5	4.5
1989	354.1	2,131.1	153.0	3.7	72.1	40.5	7.39
1990	318.2	2,429.3	167.5	2.2	74.5	39.6	8.04
1991	296.1	3,425.0	191.7	2.8	73.2	37.8	9.91
1992	366.5	3,054.9	206.4	1.5	72.3	38.4	17.3
1993	422.9	3,437.3	211.4	1.6	68.9	37.8	22.0
1994	263.2	3,818.8	209.7	1.8	71.4	38.1	21.9
1995	304.1	15,512.0	216.8	1.6	67.2	38.6	21.9
1996	174.8	17,202.0	224.8	81.3	73.7	39.0	21.9
1997	691.4	19,826.1	234.1	1.6	67.0	39.4	21.9
1998	295.1	16,338.9	242.4	2.2	48.0	40.2	21.9
1999	397.3	12,204.9	249.1	1.0	62.6	40.8	92.7
2000	407.2	9,322.2	258.2	0.5	37.5	40.4	102.1
2001	417.0	7,961.4	148.9	0.4	28.4	40.3	111.9
2002	426.9	26,955.8	154.9	1.4	28.4	40.8	121.0
2003	436.7	20,597.4	165.4	0.7	21.7	40.3	129.4
2004	446.6	30,777.2	175.5	1.0	27.1	39.8	133.5
2005	456.4	38,588.1	186.9	1.2	48.1	41.2	131.5

Source: Annual Report (various issues), Central Bank of Nigeria.

and 17.1 per cent, respectively, while earnings from cotton and rubber decreased by 35.7 and 13.5 per cent respectively. Income from processed products decreased by 32.8 per cent from 55,609 million naira in 2004 to 37,367 million naira in 2005, while income from processed skins, cocoa products and furniture/processed wood decreased by 54.8, 34.9 and 16.2 per cent, respectively, and earnings from textured yarn and 'others' increased by 99 and 395 per cent respectively (see **Tables 3 and 4** for domestic and international prices).

1.2.1 Agricultural sector vision and export growth

A vision for agriculture is expressed in the National Economic, Empowerment and Development Strategy (NEEDS) document, which was adopted in 2004. The strategic objective of NEEDS is to move the economy away from oil and to foster private sector development with community participation.

NEEDS recognizes the importance of agriculture in the Nigerian economy, despite the projected dominant role of oil as the chief export. Poverty reduction in Nigeria is critically dependent on agriculture, given the share of the labour force producing rural goods, prospects for food security and the supply of industrial raw materials. Accordingly, the government is committed to increasing investment in food and agricultural production with 3 per cent of the national budget going to agriculture and a growth target of 6 per cent for the sector. To restore agriculture to its former status as a leading sector in the economy, NEEDS envisages an increase in agricultural exports to \$3 billion by 2007 and reduction in food imports from 14.5 per cent of total imports to 5 per cent by 2007.

1.3 Constraints to agricultural export growth

The purpose of this chapter is to address the challenges of agricultural exports in Nigeria within the context of national economic growth by diagnosing the constraints preventing them from achieving their potential and, on the basis of evidence, offer policy options for greater efficiency and competitiveness.

1.3.1 Policies

Nigeria's agricultural sector became a victim of policy discrimination after the large oil discoveries. In the early 1970s, labour and capital left agriculture for manufacturing, mining, construction and services. This chronic 'Dutch disease', arising from overvaluation of the Nigerian currency, has remained with Nigeria until the present despite several structural adjustment programmes. The explanation for this development will be presented in the next section.

Before the present democratic regime was re-elected in 2003 and a new economic reform agenda was introduced, evidence-based policy-making was limited. There was little research, analysis or evaluation and an absence of in-depth knowledge and understanding of the technical issues within the public sector. Research institutes and universities were isolated from policy-making. Engagement by the

private sector concentrates on gaining access to the presidency for special favours rather than pressing for broad improvements in policy. The concern among private agents about government not keeping its word is legitimate, and their concern about policy discontinuities is valid.

1.3.2 Trade

Another detrimental policy has been the government's emphasis on local agricultural processing. Local value addition as a policy is desirable to the extent that it promotes employment and enhances foreign exchange earnings. Two major problems have caused this policy to fail in Nigeria. First, poor infrastructure and high input costs (for example energy and credit) put Nigerian goods at a competitive disadvantage. Second, importing countries often impose barriers that are sometimes insurmountable for exporting countries. (Personal communications with members of various bilateral chambers of commerce, mines and agriculture reveal this trend.)

1.3.3 Inputs

Two other policy constraints are noteworthy: exchange rate policy and input price policy. Fertilizer is an example of both. A prominent element in agricultural policy since the 1980s is public fertilizer procurement and distribution. Recognizing fertilizer as a key farm input, the government has continued to pursue a policy to ensure its use by farmers. Its supply has been increased virtually on an annual basis. For example, between 1989 and 1990, it increased by 33 per cent, in 1991 by 14 per cent and in 1993 by 15 per cent. The important issue here is that supply has consistently, and increasingly, lagged behind demand, giving rise to price increases and fraud in distribution. To increase access by farmers, the number of depots was increased, and the federal government bore the cost of transportation from domestic plants and seaports to the depots.

A fertilizer price subsidy has also been prominent. However, following the SAP, subsidies were steadily reduced. This therefore became a case of conflict of policies – public procurement policy sought to encourage fertilizer use by farmers, while input price policy raised the cost to farmers. A natural outcome of this has been the low usage of fertilizers. Yearly nationwide surveys of agriculture show that increases in the price of inputs made it difficult for farmers to procure them in the required quantities. This has been attributed to the depreciation of the naira, the increased cost of public utilities and reduction in subsidies on fertilizer, fuel, agro-chemicals and seeds. For example, a 50kg bag of fertilizer sold in 1999 for 1800 naira in most parts of the country, as against the recommended 800 naira subsidized price. Thus, naira exchange rate devaluation and continued depreciation which, on the one hand, boosted export and producer prices, on the other, combined with subsidy policy to raise the cost of input prices, and thus limited their use by smallholder farmers who constitute the bulk of agricultural producers.

Table 3 Domestic producer prices of agricultural export crops (naira per ton)

Year	Groundnut	Benniseed	Soybeans	Cottonseed	Palm kernel	Palm oil	Cocoa	Rubber
1970	63	81	37	108	57	81	295	
1971	67	81	37	108	57	89	297	
1972	75	81	37	123	61	76	297	
1973	80	105	47	132	61	84	354	
1974	145	169	60	156	142	204	487	
1975	250	264	99	308	150	265	660	
1976	350	264	99	308	150	265	660	575
1977	275	290	130	330	150	295	1,030	575
1978	290	300	135	330	150	355	1,030	575
1979	350	300	135	330	180	450	1,200	692
1980	420	315	150	400	200	495	1,300	795
1981	450	315	155	465	200	495	1,300	1,000
1982	450	315	175	510	230	495	1,300	1,200
1983	450	360	230	560	230	495	1,400	1,200
1984	650	360	300	700	400	600	1,500	1,300
1985	750	360	500	800	400	600	1,600	1,300
1986	1,000	360	550	1,000	400	1,000	3,500	1,200

1987	2,075	2,295	1,500	4,000	850	1,200	7,500	1,000
1988	2,250	2,000	2,000	4,500	1,000	1,500	11,000	1,500
1989	4,775	5,120	4,030	2,433	1,800	1,310	10,100	2,000
1990	4,320	4,410	4,920	2,600	2,000	1,160	8,500	1,395
1991	6,280	5,979	3,960	4,163	2,525	1,258	1,015	3,300
1992	6,843	9,792	7,225	3,778	5,692	12,472	12,745	12,520
1993	12,958	13,388	11,688	3,372	10,567	20,836	25,278	24,091
1994	13,500	26,307	12,756	45,000	14,374	98,630	61,180	34,400
1995	20,064	51,550	18,827	40,972	18,239	66,190	82,674	53,707
1996	24,125	41,028	30,778	37,757	22,185	55,853	80,222	51,917
1997	17,797	38,392	28,192	35,833	16,554	48,477	89,687	56,722
1998	21,509	37,611	32,850	32,953	21,000	59,280	79,600	61,833
1999	28,097	46,532	39,813	40,208	19,129	51,535	85,766	57,892
2000	44,110	51,134	42,690	35,000	20,000	64,587	90,000	59,400
2001	44,843	63,349	47,908	33,204	23,379	78,458	100,944	69,800
2002	45,636.7	66,516.5	49,370	33,868	23,500	88,300	130,670	95,667
2003	46,503.8	75,114.5	53,072.9	32,052.2	24,322.5	99,955.6	150,943.3	113,898.6
2004	47,480.4	78,569.7	56,045	31,250.9	24,736	11,0151.1	165,735.8	116,290.5

Source: Statistical Bulletin (various issues), Central Bank of Nigeria.

Table 4 International prices of agricultural export crops (\$ per ton)

Year	Groundnut	Benniseed	Soybeans	Cottonseed	Palm kernel	Palm oil	Cocoa	Rubber
1970	88	113	51	151	79	113	412	
1971	96	116	53	155	81	127	427	
1972	114	123	56	186	92	115	451	
1973	121	159	71	200	92	127	538	
1974	230	268	95	247	225	323	773	
1975	405	428	160	500	243	430	1,071	
1976	558	421	158	491	239	422	1,053	917
1977	425	448	201	510	231	456	1,592	889
1978	478	495	222	544	247	585	1,699	948
1979	587	503	226	553	302	755	2,014	1,161
1980	768	576	274	732	366	905	2,379	1,454
1981	737	516	254	762	327	811	2,131	1,639
1982	668	468	260	757	341	735	1,931	1,783
1983	621	497	317	773	317	683	1,933	1,657
1984	849	470	392	915	522	784	1,961	1,699
1985	839	402	559	895	447	671	1,790	1,454
1986	494	178	272	494	197	494	1,732	593

1987	516	571	373	995	211	298	1,866	248
1988	495	440	440	991	220	330	2,424	330
1989	646	692	545	329	243	177	1,366	270
1990	537	548	612	323	248	144	1,057	173
1991	633	603	399	420	254		1,025	534
1992	395	566	417	218	329	720	736	723
1993	587	607	530		479	944	1,146	1,092
1994	616	1,202	582	2,056	656	4506	2,795	1,571
1995	916	2,355	860	1,872	833	3024	3,777	2,453
1996	1,102	1,874	1,406	1,725	1,013	2551	3,665	2,372
1997	813	1,754	1,288	1,637	756	2214	4,097	2,591
1998	982	1,718	1,500	1,505	959	2708	3,637	2,825
1999	303	502	429.	433	206	555	925	624
2000	432	500	418	342	195	632	881	581
2001	400	565	427	296	208	700	901	623
2002	377	549	408	279	194	729	1,080	790
2003	359	580	410	247	188	772	1,166	880
2004	355	588	419	234	185	825	1,241	871

Source: Annual Report (various issues), Central Bank of Nigeria.

1.3.4 Finance

Policy towards agricultural finance can be grouped into five categories: (i) credit guidelines by the Central Bank of Nigeria (CBN); (ii) concessional interest rates; (iii) rural banking schemes; (iv) agricultural credit guarantee schemes; (v) direct lending. Starting from fiscal year 1972, the CBN prescribed credit allocation by banks to designated sectors. Banks were required to lend a minimum proportion of their loan portfolio to agriculture. The mandatory sector allocation requirement was abolished in October 1996. The historical guidelines were not really adhered to by the banks, with agriculture being one of the sectors most affected because banks did not lend to rural projects. Rather, they preferred to pay the penalties for not lending according to the guidelines.

Before the deregulation of interest rates in July 1987, lending to agriculture was largely concessional. Between 1980 and 1986, it was held below or in line with the CBN minimum rediscount rate. Between 1987 and 2000, the normal market rate charged on all loans was applicable to agriculture. In 2000, banks submitted their proposals for a lower interest rate to farmers under the Agricultural Credit Guarantee Scheme (ACGS) to the CBN in view of the high rate of default by beneficiaries of the ACGS. The proposal was rejected. Thus, the high cost of capital continued to pose a constraint to agriculture growth, including exports.

A rural banking programme was introduced in 1977, designed to mobilize rural savings and to channel them into productive rural activities. By June 1992, 765 bank branches had been opened in 766 centres. The ratio of locally mobilized funds to rural lending was clearly stipulated. In 1977, it was 30 per cent and, by 1993, it had been raised to 50 per cent. The mandatory credit allocation was abolished in October 1996. Again, while it lasted, the effectiveness of the policy remains contentious. The ACGS, which was established in 1978 to provide guarantees in respect of loans and advances granted to the sector, was designed to encourage banks to increase their credit facilities to farmers. The scheme, funded by the Federal Government of Nigeria (FGN)/CBN in the ratio of 60:40, had a 100 million naira capital base. The fund was required to repay 75 per cent of loans if beneficiary farmers failed to repay the banks under the scheme. Available data show that an average of only 25 per cent of lending under the scheme during the first five years of operations had maturity of 24 months and above. Lending under the scheme represents about 20 per cent of overall agricultural lending. However, from 1985, the CBN began to stipulate grace periods for agriculture loans – one to four years for small-scale farmers producing cash crops, and five years for medium- and large-scale mechanized farmers.

The scheme did little to provide credit to smallholders. In 1978, the first year of operation, only 10.4 million naira was guaranteed as loans. In 1981 and 1984, the figures were 32.2 million naira and 24.7 million naira respectively. Moreover, large farmers and cooperatives received the bulk of the guaranteed loans, while loans received by small farmers were insignificant. Specifically for major export cash crops, in the early 1990s, those receiving guarantee for loans of 20,000 naira and above formed the greater proportion of beneficiaries. From the mid-1990s,

guaranteed loans for agricultural exports became really insignificant. With such development, commercial banks, being naturally risk averse, would be hesitant in their lending to smallholder farmers who do not usually have adequate security to cover such loans.

Direct lending to agriculture has been promoted from commercial and publicly sponsored specialized banks. Merchant banks, which perform better on long-term lending than the conventional commercial banks, would be expected to see agricultural investment fall within their portfolio. However, smallholder export crops farmers have benefited very little. For example, 90 per cent of merchant bank loans for agriculture in 1994–99 went to corporate entities. Nigeria Agricultural and Cooperative Rural Development Bank has two types of lending, direct and indirect lending. The latter is usually to states' Ministries of Agriculture for onward lending to small farmers. The former is direct lending to beneficiaries by the bank. It has been observed that the bank's disproportionate allocation of loans in favour of large borrowers may indicate the bank's recognition of economies of scale and the reduction in transaction costs associated with large-scale borrowing.

A further problem has been the fate of the specialized lending institution known as the Nigeria Export–Import Bank (NEXIM). NEXIM was established primarily to grant credit to exporters through participating commercial banks, to identify export markets for Nigerian commodities and to link overseas markets with exporters. NEXIM was expected to work closely with the Nigeria Export Promotion Council, which is charged with administering export incentives across all states. The two institutions faced serious challenges in discharging their responsibilities. Corruption contributed in no small measure to the poor records of the two institutions, especially in administering incentives such as the duty drawback scheme. NEXIM was confronted with additional problems of volatile foreign exchange availability and undercapitalization.

1.3.5 Rural infrastructure and extension services

These are constraints to exports and output. Lack of basic rural infrastructure, especially roads, raises the cost of farm inputs for smallholders and reduces output prices paid to them. Directorate for Food, Roads and Rural Infrastructure (DFRRI) and agricultural development projects (ADPs) were intended to address the problem of rural infrastructure. The failure of DFRRI to make much impact on rural infrastructure is well known, although the causes may include the politicization of its administration. Similarly, the ADPs have had little sustained impact on rural infrastructure.

Provision of extension services has been likened to a factor of production in that it enhances entrepreneurial skills in peasant farmers. It performed this function reasonably well in the 1960s. With rapid development of new varieties of most crops by research institutes since the 1980s, the need for extension services to inform farmers on their use is more pressing than ever before. However, most ADPs were unable to provide extension services to farmers in their zones because of lack of funds. This development has been attributed to the phasing out of the

World Bank's ADP loan facilities, as the federal and state governments were not able to contribute matching funds for their sustainability.

1.4 Agricultural policy in Nigeria

The last section identified some domestic agricultural policies among the various constraints preventing the realization of the potential of agricultural exports in Nigeria. This section explains the policy failures in greater detail.

Daramola (2004) argues that agricultural policy formulation in Nigeria is a typical market. This position is derived in part from Anderson and Tyers (1988), who argue that the forces of demand and supply for policies are conceptualized. In this view, policy beneficiaries demand policies and politicians supply them. Under the situation of 'distorted' pricing policy, as we have experienced in Nigeria in the recent past, the supply curve in this market represents the marginal political cost of providing an extra unit of protection to (or less taxation of) an industry, in terms of reduced political support from groups opposed to such a policy change, while the demand curve represents, at the margin, the preparedness of groups seeking policy change to offer various degrees of political support to the leadership. Under this general framework, there is also the need to accommodate social and government preferences, which include altruism, in addition to pressure from various private interest groups, on the supply side of policies. Therefore, the task has been reduced to examining the factors influencing the demand for and supply of distorted policies in Nigeria vis-à-vis those of other countries at different stages of development. This is the foundation for the unfavourable agricultural policy environment prevailing hitherto in Nigeria.

In poor countries, the demand for agricultural protection, especially producer price support, is often weak. This is because marketable surplus and potential benefits are low relative to the high cost of collective action by farmers. It is costly to organize for collective action owing to the large numbers of farmers, geographical dispersion, poor infrastructure and low education in rural areas. Other pressure groups are not interested in policies favourable to agriculture because such groups – farm inputs and processing – are rudimentary. Urban elites favour industry, commerce, mining, construction and other sectors.

In Nigeria, policies under successive military regimes before 1999 discouraged agriculture. The industrialists, being fewer in number, better educated, urban based, politically connected and with better access to infrastructure, gained better assistance and support policies. Generally, poor countries (including Nigeria) tax agricultural export and/or import in order to promote the manufacturing sector, which they expect to replace imports. Besides, it is easier to tax export commodities directly than to raise general tax revenue through income or sales tax because the latter option is rather expensive to collect.

Agricultural policy in Nigeria can be discussed in four periods: 1960–69, 1970–85, 1986–98 and 1999 to date.

1.4.1 Pre- and civil war period (1960–69)

The Nigerian economy between 1960 and 1970 can be treated in two periods: from independence in 1960 to the civil war in 1966 and the civil war years (1967–70). In the period 1960–69, there was minimal direct government involvement in agriculture. The federal government played a supportive role, while regional and state governments were left to take major initiatives. During the early period of Nigeria's history, different regions specialized in producing various agricultural exports. Crude oil was discovered in Nigeria in commercial quantities, and the Shell Petroleum Company constructed the first oil well at Oloibiri in 1958. However, it was not earning as much foreign exchange as agriculture was fetching for the regional governments. Nigeria could be described as having a very robust agricultural sector during the period. The country was self-sufficient in food production with minimal imports of processed food for elites. Farmers produced enough food crops to feed the population and export crops to finance government expenditure. In fact, agriculture was being taxed to develop the other sectors of the economy such as education, health, construction and finance imports through the foreign exchange being earned from agriculture.

The northern region (including the Middle Belt) was largely exporting cotton, hides and groundnuts; the South West region specialized in cocoa, while the South East region (including the present South South) was a major exporter of rubber and palm produce. Smallholder farmers produced the bulk of agricultural output for both local and export markets. Government focused on research, extension services, marketing and pricing of export crops. However, it is important to mention here that the export crops sub-sector of the Nigerian economy was then stronger than the food crop sub-sector because of the desire of the pre-independence colonial government (UK) to feed their domestic industries with raw materials. Nigeria was a very small importer of food crops.

1.4.2 Post-civil war/oil boom era (1970–85)

The crisis of agricultural exports in Nigeria started around 1970. This was the era that launched the oil boom, dilapidated infrastructure and destroyed most large palm oil plantations in eastern Nigeria. The windfall from the oil wealth was not invested in agriculture, but rather in commerce, construction and manufacturing, leading to neglect of the agricultural sector. These sectors conspired by attracting factors of production away from agriculture, leading to a serious problem of 'Dutch disease'. Another serious consequence of the oil boom was currency overvaluation, which led to Nigerian agricultural exports being uncompetitive. The major factor responsible for the decline in agriculture was the discrimination against agriculture in favour of the urban (real) sectors (especially manufacturing) and services. Factors of production such as land and labour migrated out of the rural agricultural sector to the urban industrial sector because of booms in the construction, manufacturing and service sectors that were paying higher returns on those factors.

The period 1970–85 witnessed more direct government intervention in agriculture in the face of the noticeable decline in agriculture performance. A variety of policies were introduced. Macroeconomic policies became expansionary, including direct government involvement in agricultural production; incentives were introduced, including low tariffs on agricultural inputs.

The period witnessed the establishment of many new agricultural institutions and programmes. Notable were the Nigerian Agricultural and Co-operative Bank (NACB) in 1973 and the Agricultural Credit Guarantee Scheme Fund (ACGSF) in 1978, established to provide agricultural finance. (More will be said about these institutions' operations below.) During this period, World Bank-assisted ADPs were introduced in a number of states. The programmes were designed to provide an integrated approach to agricultural and rural development. River Basin Development Authorities were also established to provide all-year-round water through irrigation to farmers. More research institutes were established during this period. In anticipation of the increased agricultural output arising from these projects and Operation Feed the Nation (OFN), there was a reorganization of marketing boards, which gave rise to the grain boards.

1.4.3 Structural Adjustment Programme period (1986–92)

The decline in world oil prices in the early 1980s, coupled with mismanagement by the civilian administration, gave rise to twin deficits in Nigeria: fiscal and current accounts. Increasing import bills, coupled with declining foreign exchange receipts from oil, made Nigeria unable to finance her current account deficit. Mismanagement of the budget, coupled with declining fiscal receipts from oil, caused the fiscal deficit to grow. Nigeria's creditors compelled the country's political leadership to submit to the macroeconomic policies of the International Monetary Fund (IMF) as a condition of new credit. For a detailed discussion of this era and its effect on agriculture, see Daramola (1989).

There was a consensus that the military leaders had mismanaged the economy and that radical reforms were needed. After some lengthy debates as to the desirability of taking additional loans, and against public opinion, the government decided to accept the IMF conditions in 1986, culminating in the SAP era, which was largely contrary to national public opinion.

The SAP period began the era of liberalization of Nigerian agricultural exports, including the scrapping of the commodity boards and deregulation of the entire economy. During the period 1986–99, which combines the SAP and post-SAP era, market-oriented and not so market-oriented agricultural development policies and programmes were introduced. River Basin Authorities were restructured from 21 to 11; the DFRRRI was established, as well as the National Agricultural Insurance Corporation and Peoples' Bank. Farm input supply policy was actively pursued during this period. Trade liberalization was an important aspect of SAP. Abolition of import and export licensing and exchange control measures took place. With these reforms, export earners became entitled to 100 per cent of their foreign exchange earnings provided these were kept in a domiciliary account. Thus, agricultural producers had an incentive to boost their exports.

The Export Incentive and Miscellaneous Provisions Decree of 1986 was enacted, through which the CBN could provide refinancing and discounting facilities to commercial and merchant banks to encourage them to provide credit and risk-bearing facilities in support of exports. This subsequently led to the establishment of the Nigerian Export Credit Guarantee and Insurance Corporation in 1988, which was subsequently renamed the Nigerian Export-Import Bank (NEXIM). The institution actually commenced operations in 1991. Perhaps the most visible and pervasive policy under SAP is the naira exchange rate devaluation. The rate, which was 0.639 naira to the US dollar in 1981 and 0.9996 naira in 1985, averaged 3.32 naira in 1986. By 1992, it had fallen to 19.66 naira and to 91.83 naira in 1999.

Economic theory suggests that exchange rate devaluation is good for exports as it makes export prices more competitive because it leads to a higher farm gate (domestic) price. At the same time, devaluation makes imports more expensive. So, for an economy dependent on imported inputs, devaluation has a dual impact. An assessment of the effect of the trade policy reforms suggests that these have indeed been beneficial to agricultural exports. While devaluation boosted exports, liberalization of export and pricing mechanisms brought about convergence of domestic prices with world export values. For example, the ratio of producer prices to export prices for cocoa and palm kernel converged significantly and sometimes went above 100 per cent, indicating that exporters were paying farmers prices that were above world market prices. This practice was common among Asians who wanted to beat foreign exchange repatriation regulations in Nigeria until 1994. From 1995 to 1999, prices began to diverge noticeably, to the extent that the implicit tax was above 50 per cent (that is -0.56 to -0.80), particularly for rubber, cotton, groundnut and palm kernel. Some may attribute the latter trend to the reversal in effective implementation of the SAP from 1994 (Adubi and Okunmadewa, 1999).

There is no doubt that the tremendous boost in producer prices was due to naira devaluation. For example, the naira value of the world market prices of cocoa, rubber, cotton and groundnut rose from 2135 naira, 714 naira, 5170 naira and 824 naira per ton in 1985 to 7387 naira, 16,739 naira and 790 naira in 1991, representing 246, 967, 1331 and 859 per cent increases respectively. The increase in the naira value of world market prices was similarly translated into increases in producer prices of cocoa, rubber, cotton and groundnut from 1500 naira, 750 naira, 700 naira and 1750 naira per ton in 1985 to 12,745 naira, 5692 naira, 3778 naira and 6843 naira in 1992. And as [Table 4](#) shows, the increase continued in the 1990s (see [Figures 1](#) and [2](#)). Cocoa, rubber and palm kernel enjoyed 502.3, 549.1 and 469.3 per cent increases, respectively, in 1991–94, and 40.2, 68.3 and 33.1 per cent increases in 1994–99. The position outlined here is that growth in agricultural export earnings in recent decades has merely been a price effect, with little output effect even when allowance is made for time lags in output changes relative to price changes. The latter effect is what is required to give real sustained growth in agricultural export.

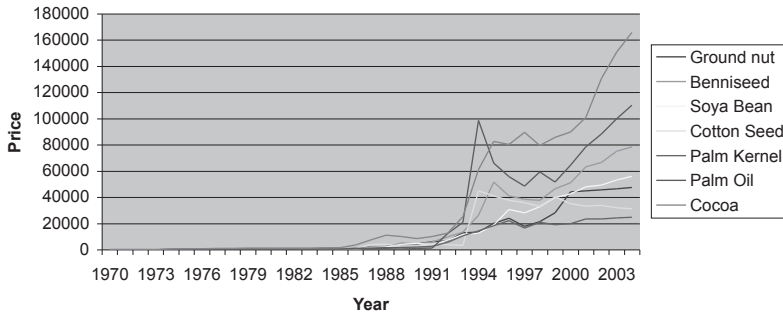


Figure 1 Average domestic producer prices of agricultural export crops.

1.4.4 Post-SAP period (1992–99)

The annulled presidential elections in Nigeria in 1993 caused a political crisis, which halted the national economy. The military regimes of Generals Babangida and Abacha held sway during these periods with the exception of less than one year each of Chief Sonekan and General Abdulsalam. In terms of economic policies and agricultural exports, the period was uneventful as the successive governments were just trying to find acceptable solutions to the political crises in the country. The period coincided with various economic sanctions from western nations that happened to be the importing nations such as Canada, the UK and the USA. There were foreign exchange restrictions and import licensing, and the food bill was growing from year to year. Production and productivity did not grow. In this period, the oil windfall from the 1991 Gulf War had been frittered away, and the only thriving business was government.

1.4.5 Current democratic regime (1999 to date)

Three documents that clearly spell out Nigeria’s vision for agricultural development are the National Economic Empowerment Development Strategy (NEEDS), National Agricultural Policy (NAP) and Rural Sector Strategy (RSS), 2004. The overall strategic objective of the NEEDS and NAP is to diversify the productive base from oil and to promote market-oriented and private sector-driven economic development with strong local participation. NEEDS provides the overall framework of nationally coordinated sectors’ strategies, while NAP aims at laying a solid foundation for sustainable growth in agricultural productivity. The latter is a well-thought-out document that provides a road map for the transformation of both agricultural productivity and exports.

The period of democracy has coincided with another oil boom as the price of crude oil has witnessed unprecedented gains in recent times. There has been massive inflow and injection of capital into the agricultural sector through budgetary allocations, donor agencies and foreign investments. A combination of these factors coupled with improved inputs such as fertilizers, seeds, credit and so on has

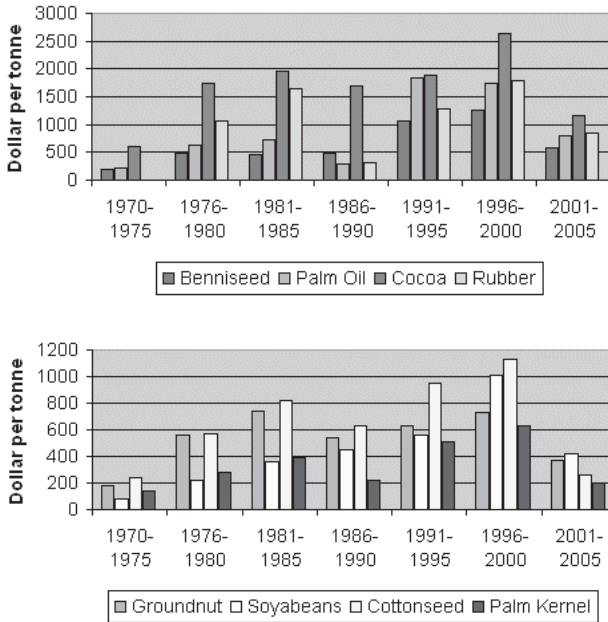


Figure 2 International average prices of agricultural export crops.

explained the growth in both agricultural productivity and export sub-sectors. The details of the growth and explanations for it will be covered under the section on policy reforms. However, Table 5 provides some information about the policy changes in Nigeria over time.

1.4.6 Impact of policy reforms

Since the present democratic administration assumed office in 1999, there have been significant strides in agriculture. Some growth can be attributed to public investment in the sector, notably the World Bank-assisted Fadama I and II. There are other initiatives such as the Food and Agriculture Organization (FAO)-assisted National Special Programme on Food Security (NSPFS), the International Fund for Agricultural Development-assisted Root and Tuber Expansion Project. All these projects have combined to raise the contribution of agriculture to GDP growth to 5.5 per cent in recent years (CBN, 2005). However, the major leap to 7 per cent per annum is a product of the bold reforms within the Nigerian macroeconomy, the conclusion of the NAP and reforms in the financial sector. It is the reform agenda that gave birth to many presidential initiatives on various commodities such as rice, cassava, livestock, palm oil. The reform within the financial sector has led to the banking sector being stronger and more willing to finance real sector activities such as agriculture and manufacturing. The poor liquidity of banks and the paucity of investment funds has been boosted by pension reform, which

Table 5 Summary of government incentives and export performance in agriculture

Name of incentive	Purpose of incentive
Refinancing and Rediscouinting Faculty (RRF) and Foreign Input Facility (FIF)	To provide liquidity to banks in support of their finance business directed on export promotion and development. RRF took off in 1987 and FIF in 1989
Currency retention	Allows exporters to hold export scheme proceeds in foreign currency in their bank. Took off in 1986
Tax relief on interests earned by banks on export credit	To encourage banks to finance exports by reducing their tax burden. Became effective in September 1986
Export Credit Guarantee and Insurance Scheme	Assists banks to bear the risk in export business, thereby facilitating financing and export volumes
Duty Drawback Scheme	To reimburse custom duty paid by exporters on imported inputs used for banks and CBN export production. This has not been widely used by exporters due to the cumbersome procedural requirements involved, although the fund was increased to ₦50 million in 1988
Export Expansion Grant	To encourage companies to engage in export business rather than domestic business, especially exporters who can export ₦50,000 worth of semi-manufactured or manufactured products
Export Price Adjustment Scheme	This is a form of export subsidy designed to compensate exporters of products whose foreign prices become relatively unattractive to exporters due to factors beyond the exporters' control
Export Development Fund	To assist exporters in partly paying the costs of participation in trade fairs, foreign market research, and so on. This is an old scheme
Accelerated depreciation to capital allowance	To extend supplementary incentives to industrial organizations for export of their products. Started in 1986
Manufacturing-in-Bond Scheme	To assist potential exporters of manufactured products to import duty-free raw materials for the production of exportable products
Presidential initiatives	A wide range of sub-sector-based initiatives since 1999 to achieve accelerated investment and growth through a combination of assured protection combined with other support instruments, based on active public-private partnerships. Sectors with initiatives include cassava, fish, rice and furniture

has led to the availability of longer term credit facilities and a reduction in the cost of finance through a lower interest rate.

There is also an aggressive drive by the federal government to attract foreign investment into Nigeria. Notable agricultural investors include the United States Agency for International Development, the UK Department for International

Development, the Canadian International Development Agency, the Japan International Cooperation Agency, Chinese and Zimbabwean (white) farmers. In many different ways, these interventions have been manifested as growth in the GDP, which is now higher than the rate of population growth. The implication of this is that poverty will decline as a result of the rate of growth in GDP (estimated at 7.5 per cent) being faster than population growth (estimated at 3.0 per cent). It is important to note that agriculture contributes at least 40 per cent to GDP growth in Nigeria, and the sector itself has been growing at an average rate of 6.5 per cent per annum.

1.5 Effects on agricultural output and productivity growth

Before the present government assumed power in 1999, agriculture was growing at an average of about 2.8 per cent per annum, mainly as a result of acreage expansion. Subsequently, with the reform agenda of the democratic government and better macroeconomic policies, the country has witnessed some improvements in the business environment and productivity. Through the various presidential initiatives, constraints confronting different commodities are being addressed one after the other. According to the CBN (2005), the cumulative effect of these reforms is that the agriculture sector has been growing at between 5.5 per cent and 7.5 per cent in the last five years.

The presidential initiative committees meet at regular intervals to brief the president, and the composition of each is usually stakeholders; meaningful progress is being recorded on all fronts. One of the most successful initiatives is the National Cocoa Development Committee (NCDC), which is made up of powerful representation throughout government. The committee is having a positive impact on the cocoa economy of Nigeria. The only concern of scholars and planners is how to institutionalize some of these initiatives such that, when the country elects a non-farmer as president, these initiatives will not be discontinued.

According to the World Bank (2006a), the fundamental cause of low agricultural productivity in Nigeria is the very low use of modern technology evidenced in weak research and extension, limited use of improved seed varieties (and breeds) and lack of irrigation. In addition, weak human resource and skills bases are also factors. Nigeria's national research system has enjoyed only limited success in generating new technologies that have been taken up by farmers. This is due to: (i) poor funding of public research organizations; (ii) weak coordination within the Nigerian agricultural research institutes (NARIs), resulting in unnecessary duplication of effort; (iii) a tendency for research to be supply driven, with little accountability to farmers. Public institutes responsible for conducting agricultural research in Nigeria have been underfunded, especially under military regimes. Within the NARIs, budgets have remained flat even as staffing has increased, forcing severe cutbacks in operating budgets. Lack of systematic collaboration between research institutions in the agricultural sector has created sub-optimal allocation of resources characterized by duplication of effort in some areas and

underinvestment in others. Farmers have had limited influence over the orientation of research, leading to the development of technologies that do not address farmers' problems.

Another closely related factor is the fact that extension services in Nigeria are delivered mainly through public agencies known as the ADPs. Many of the state-based ADPs were established and empowered with World Bank credit facilities in the late 1970s and early 1980s. Then, they were actively engaged in the provision of integrated agricultural and rural development services. They were quite successful but suffered lack of sustainability when the credit expired. Some private agribusiness firms, mainly input dealers, provide extension advisory services to their clients, but the coverage is limited to a few crops. Public agricultural extension programmes in Nigeria are vested in all three levels of government. The weakness of the extension system is primarily caused by chronic underinvestment within each level. Similar to the research system, the extension system lacks accountability to farmers.

Starting in the 1980s, the federal government established a unified agricultural extension system. Although coordinated at the federal level, this system is implemented through the ADPs, which are run by the state Ministries of Agriculture and Natural Resources. At the local level, many local government authorities (LGAs) maintain agricultural units that offer extension services. Recently, all states agreed to standardize extension service delivery through the LGAs. This common approach has met with limited success.

1.5.1 Effects on export-crop prices and supply response

Nigeria has a potential comparative advantage in many rural goods, but low productivity has been a barrier to greater competitiveness. Ecologically and climatically, Nigeria has at least 95 different commodities that can be cultivated in different parts of the country. For example, while the Senegal basin produces *nerica* at about 7.5 tons per hectare (WARDA, 2005), Nigeria at best records 4.0 tons per hectare under *nerica* trials (WARDA, 2005). The high cost of production tends to make Nigerian exports uncompetitive. Nigerian hides and skins, especially those from the Sokoto goat breed, command a premium in the international leather market. The reform agenda has succeeded in bringing the challenges facing exporters and manufacturers to the fore. The Nigerian tanneries buy raw materials from everywhere in western and central Africa in order not to have their factories idle. And the challenges they face in the course of their business, such as the state of the infrastructure of water, electricity and roads, have been brought to the notice of government for urgent remedies.

All over the world, producer prices are normally an incentive for farmers to produce more. However, for the export sector in Nigeria, because the export commodities are in their primary forms, international prices have generally been on the decline and unattractive. Under Nigeria's often volatile foreign exchange regimes, the farmers' incomes (producer prices) from export will be static at best, if not dropping; hence, it becomes fairly difficult to sustain production. This is

particularly true in Nigeria where production costs are generally high and immobile. In order to rectify this situation, government policy in recent times has been to encourage the addition of added value to primary products before export. The importing countries, especially in North America and Europe, discourage local value addition (especially for cocoa) because it takes away employment from their citizens, while also increasing their costs of production because of higher import costs (free on board (f.o.b.) or cost, insurance and freight (c.i.f.)). What the importing countries usually plead as excuses are poor standards (specifications) and unhygienic conditions of the processing environment in exporting countries. So, supply response to price incentives can be high initially as a result of devaluation, but the money illusion soon disappears because of rising input costs. This was the experience of cocoa farmers in the late 1980s when the SAP was introduced. So, the devaluation was nominal.

1.6 Competitiveness of Nigerian exports

The Nigerian economy is one of the least competitive globally and even in Africa because of inappropriate policies and an unfavourable business environment. On several of the 'doing business indicators', Nigeria performs poorly when compared with most other economies including low-income economies in Africa. The World Economic Forum (WEF) 2006 report ranks Nigeria 88 out of 117 countries on its global competitiveness indicators (GCI). Despite the large domestic market, only a small proportion of producers have been able to develop into sizeable businesses able to compete internationally, as shown by the long-term decline in non-oil exports.

Total factor productivity (TFP) growth has been low and appears to have fallen consistently between 1970 and 2000 (World Bank, 2006b). Increases in productivity per capita have been negligible. In agriculture, yields have been falling and, in manufacturing, there is considerable unused capacity (World Bank, 2006b). It is instructive that, over the decades, countries such as Indonesia had both increases in capital per worker as well as increases in TFP, while Nigeria had declines in TFP and negligible increases in capital per worker. In fact, it even looks as if there were 30 years in which TFP fell, although there is some indication that this has been changing more recently (Table 6).

While the human capital contribution is smaller, a characteristic of this TFP methodology, the increases in human capital in Indonesia tend to be much larger.

However one approaches competitiveness, whether from the perspective of an enterprise or a sector, such as agriculture, maintaining competitiveness is a dynamic concern. In the Nigerian agricultural sector, in both absolute and relative terms, performance can be described as uncompetitive and generally poor. To assess competitiveness, observers often refer to changes in market share, exports and profitability but, ultimately, the competitiveness of a nation's product is rooted not in any single outward measure, but in the quantity and quality

Table 6 Contributions to total factor productivity (%) in Nigeria and Indonesia, 1961–2004

	Output per worker	Human capital per worker	TFP	Capital per worker	TFP	Capital per worker
5% depreciation						
Nigeria						
1961–1970	2.8	0.1	2.2	0.5	2.7	-0.1
1971–1980	2.1	0.2	-0.5	2.4	-0.1	2.0%
1981–1990	-1.8	0.3	-1.4	-0.7	-1.3	-0.7
1991–2000	-0.5	0.2	-0.9	0.2	-0.9	0.2
2000–2004	2.2	0.2	1.4	0.6	1.4	0.6
Indonesia						
1961–1970	2.2	0.5	1.4	0.3	1.9	-0.2
1971–1980	5.2	0.4	1.9	2.9	2.4	2.5
1981–1990	3.6	0.1	1.1	2.4	1.2	2.3
1991–2000	2.2	0.6	0.2	1.4	0.2	1.4
2000–2004	2.9	0.6	2.0	0.4	2.0	0.3
10% depreciation						
Nigeria						
1961–1970	2.8	0.1	3.3	-0.6	3.9	-1.3
1971–1980	2.1	0.2	-0.5	2.4	-0.2	2.1
1981–1990	-1.8	0.3	-0.8	-1.3	-0.8	-1.3
1991–2000	-0.5	0.2	-1.0	0.3	-1.0	0.3
2000–2004	2.2	0.2	1.3	0.7	1.3	0.7
Indonesia						
1961–1970	2.2	0.5	2.5	-0.8	3.1	-1.4
1971–1980	5.2	0.4	1.8	3.1%	2.2	2.7
1981–1990	3.6	0.1	1.2	2.3	1.2	2.3
1991–2000	2.2	0.6	0.5	1.1	0.5	1.0
2000–2004	2.9	0.6	2.4	0.0	2.4	0.0

TFP, total factor productivity.

Source: authors' calculations from World Development Indicators data.

of the country's productive resources. These are the factors that determine the relative efficiency of making different goods and, consequently, a country's 'comparative advantage' in international trade. The idea that comparative advantage depends on relative resource endowments conveys the sense that nations have little control over their economic destinies, at least in international trade. This is not entirely true as government policies, national institutions and even cultural values can profoundly affect the overall productivity of many countries' existing resources, and have important implications for international agricultural markets.

There are success stories of countries that have achieved competitiveness in a few export crops such as cashews in Tanzania and Vietnam, cocoa in Côte d'Ivoire and Indonesia, palm oil in Malaysia, rice in India and Bangladesh, and cassava in Thailand (Figure 3). One important similarity between these countries and Nigeria is that they are all developing nations and evidence that it can be done in Nigeria when the required political will is applied. When significant policy changes are made, the result can be rapid changes in the competitiveness of a nation's agricultural products.

1.6.1 Globalization, competitiveness and international trade

Globalization is an important determinant of competitiveness requirements. The pressures of world markets arising from Nigeria's commitment to the World Trade Organization (WTO), the General Agreement on Trade and Tariffs (GATT) and even at the regional level with the Economic Commission of West African States (ECOWAS) and African Union (AU) will continue to increase the need for enterprises to adapt to change. These commitments call for government to look at the policies and institutions required to help Nigerian enterprises grow and thrive. Rapid technological change is altering the nature and location of production. This, together with trade liberalization and the free movement of capital, is driving the phenomenon of globalization. Indeed, the foreign direct investment (FDI) that can contribute so much to national economic growth is a direct manifestation of globalization, where a product can be designed in country A, using raw materials from country B, manufactured in country C, using components from country D and marketed in country E (such as electronics). A good example is the

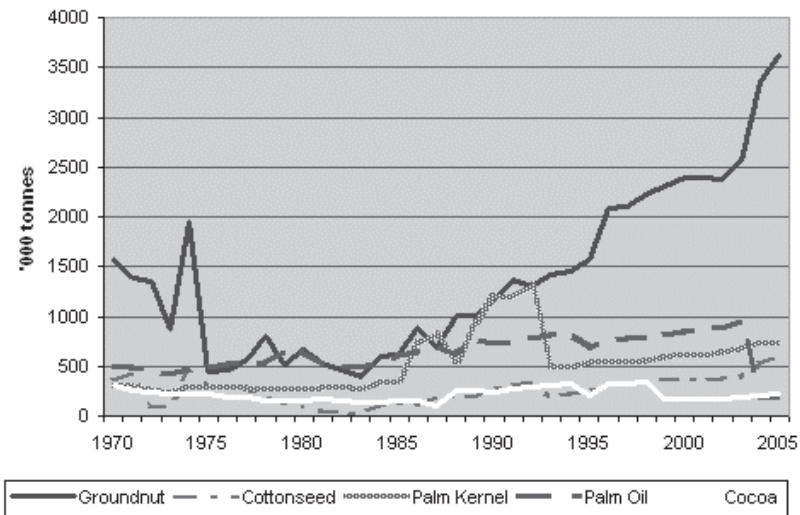


Figure 3 Trend in production of agricultural export crops.

fact that Asians come to Nigeria to buy raw cashew nuts for processing in India, while consumption takes place in North America and Europe.

Therefore, Nigeria needs to take advantage of these trends in international business. Strategies of free trade and the encouragement of FDI will have to be supplemented with new strategies to enhance investment and commercial partnership links with other parts of the world. It is this concept that led the Obasanjo regime to design the National Economic Empowerment Development Strategy (NEEDS) as a panacea for the unattractive investment environment in Nigeria. As expected, opinions are divided on the appropriateness and workability of the strategies in the document. These authors belong to the school of thought that subscribes to the fact that, if NEEDS does not work, it is not because the approach is wrong. Two possibilities exist: it is either that the facts from the official statistics being employed are wrong (more likely to be underestimated or overestimated in the Nigerian case) or the political will to carry the reforms through is lacking, especially if the succeeding president in 2007 is not reform minded like Obasanjo. From the assessment done so far using the indicators available, the vision is on course and targets are being surpassed.

Given the importance of agriculture in the non-oil economy, the current low and declining level of productivity in agriculture is a clear threat to sustaining Nigeria's recent non-oil growth. While impressive, growth in agriculture in the last few years has not been driven by productivity improvements and is therefore unlikely to be sustained over the medium term. Improved agricultural productivity is necessary for transforming the sector from subsistence to commercial agriculture in order to support a modern agribusiness industry and growing non-oil exports. This is essential for successfully diversifying the economy away from oil. Moreover, with low agricultural productivity, job creation in the rural economy and in related industries will remain limited both in numbers and in levels of remuneration. Nigeria's poverty reduction objectives will be harder to achieve. Raising agricultural productivity and competitiveness therefore needs to be a central element of Nigeria's efforts to achieve sustained growth.

However, the convergence, diffusion and pervasiveness of information and communications technologies (ICT) are giving rise to a new type of economy and a new society, known as the information society. These technologies are already offering significant potential for productivity, efficiency and competitiveness gains in the enterprise sector and are having an impact on the location decisions of inward investors. To make the most of these opportunities and ensure that competitiveness is maintained and expanded in this new context, far-reaching actions will be needed in the areas of education and training, competition policy, telecommunications infrastructure and in encouraging the take-up of ICT by agricultural enterprises in Nigeria. It is important to mention here that Nigeria has recorded a major breakthrough in ICT in recent times, with the launching of the Nigerian satellite and the deregulation of the telecommunications sector. Nigeria has joined the global system of mobile telecommunication (GSM), and the private telephone operators (PTO) have introduced fixed wireless telephones. Biotech-

nology is another rapidly developing field in which the impact on markets and production location is expected to be very significant. The education, training and management systems need to respond to, and capitalize on, the opportunities that these breakthroughs represent. In the last century, the global contest was, for the better part, military in nature. Since the end of the Cold War, the battle has shifted to the boardrooms and become economic in nature, and the edge in competitiveness among nations has become knowledge based (also known as intellectual warfare). Nigeria cannot afford to be left behind in the scheme of things.

In summary, all enterprises compete on the basis of costs, although costs are not the only basis for competition. In considering Nigeria's competitiveness, the question of costs is a very important one; the costs of different goods and services that an enterprise uses will determine the price at which they can offer their goods or services on the market. If this price is higher than that of a competitor, they will lose market share. It is therefore essential that costs do not get out of line with those of Nigeria's competitors. This statement needs to be elaborated upon, as there are a number of components of costs in an enterprise. As labour costs are usually the greatest single element of total costs, it follows that countries in which labour costs are low will always have a competitive advantage, other things being equal. In the end, however, it is the total cost structure of an enterprise that determines its profitability. If in Nigeria some costs are out of line with those of our main competitors, such as the cost of infrastructure (like electricity and water), Nigeria can still compensate for these high costs by having lower costs for other inputs (such as labour) to the production process, provided that the total effect of the costs allows the enterprise still to be profitable. Productivity, which is often a combination of yield and technology, is also very crucial, and these are the issues requiring appropriate policy.

1.7 Modelling the growth potential of agricultural exports in Nigeria

There is clear interest in modernizing Nigerian agriculture on the part of the federal government, but there is insufficient knowledge about the growth potential of agriculture and, by implication, its contribution to food security and exports. This chapter employs an applied general equilibrium model (CGE) to estimate the growth potential of agriculture and agricultural exports in Nigeria. The essence of this approach is to determine whether returns on investments in agricultural production and exports can compete favourably with returns on investments from other sectors or industries such as manufacturing, solid minerals or even oil and gas. The empirical findings from this exercise provide evidence to guide Nigerian policy-makers and planners in making strategic choices with respect to agricultural exports. An interesting finding is that a few agricultural sub-sectors can really outperform some manufacturing and processing sectors under certain policy scenarios.

1.7.1 The modelling approach

The Global Trade Analysis Project (GTAP), which is an applied general equilibrium framework (Hertel, 1997), is used here to analyse the impact of agricultural productivity changes and trade liberalization in Nigeria. Recently, the 1999 Nigeria input–output statistics were included in the GTAP database.³ We use the global and economy-wide approach for several reasons: when certain agricultural industries gain in productivity, other agricultural sectors will be affected too not only through price changes in intermediate inputs (for instance cheaper feed grains), but also through price changes in primary factors (like land and labour), which will affect incomes and the consumption of food items. The global market aspect of the approach is important too given the fact that agricultural exports are a component of international trade and are affected by trade liberalization policy. The extent and conditions of international trade will determine the benefits accruing to the Nigerian economy.

The GTAP model is based on assumptions that are common in the literature: perfect competition, constant returns to scale and no change in the economy-wide employment of resources. Each economy consists of several economic agents: on the final demand side, a utility-maximizing household purchases commodities (for private and government use) and saves part of its income, which consists of returns to primary factors and net tax collections. On the production side, cost-minimizing producers employ primary factors and intermediate inputs to supply commodities. Demanders of commodities are assumed to differentiate a commodity by its region of origin (the Armington specification is applied).⁴

The analysis in this chapter is based on aggregated data and parameters derived from the current GTAP database, version 6.0 (Dimaranan and McDougall, 2005). The base year is 2001. Our data have five primary factors: land, unskilled labour, skilled labour, natural resources and capital. This analysis is based on data consisting of 19 regions and 31 sectors/commodities. Nigeria and 12 other economies represent sub-Saharan Africa (SSA); other economies are North America, the European Union, Japan, Indonesia, the rest of Asia and the rest of the world (ROW). Twelve sectors cover primary agriculture, nine sectors cover processed foods, and the rest of natural resource industries, manufactures and services are covered by ten sectors.

We ran a series of simulations to assess the impact of productivity improvements and policy changes on selected sub-sectors in Nigeria. Investment in agriculture is assumed to lead to increases in the productivity of agricultural sub-sectors, which then lead to economy-wide benefits. In particular, we model productivity gains in agriculture as Hicks-neutral technological change.⁵ We assess the impact of biased technological change, that technical change that is either land saving or capital saving.⁶ We take the simulated welfare effects from the applied general equilibrium model as an indicator of returns to investment in agriculture. The scenarios modelled are:

- sector-specific Hicks-neutral technical change (augmenting the returns to all productive factors equally);

- factor-biased technological change (such as land-specific productivity improvements vs capital-specific productivity improvements);
- improvements in domestic and foreign trade transportation;
- trade liberalization by Nigeria.

1.7.2 Findings

Table 7 and **Figure 4** show the welfare effects from 1 per cent sector-specific, Hicks-neutral, technological improvements in four economies: Nigeria, Uganda, Zimbabwe and Indonesia. We compare Nigeria with these other three economies modelled in GTAP. Uganda and Zimbabwe are two countries whose economies are largely dependent on agriculture while Indonesia is an oil-procuring economy. **Table 7** shows sector sales, welfare effects and the ratio of welfare effect to sales by sector. In Nigeria, the oil sector accounts for over a quarter of the economy. Thus, 1 per cent technological progress in the oil sector gives large welfare benefits in dollar terms, \$142.72 million. No other sector in Nigeria gives larger welfare gains.

Figure 4 focuses on medium to large sectors (with more than \$100 million in sales) in the four economies under study in the model. To address the size-of-sector issue, we divided welfare gains by the value of the sector's output, and that magnitude is shown on the vertical axis of **Figure 4**. A very important finding for Nigeria is that several food and agricultural sectors have values that are higher than that for the oil sector: cattle (1.23 per cent), other livestock (1.23 per cent), other grains (1.04 per cent) and fruits and vegetables (1.02 per cent). In Indonesia, Zimbabwe and Uganda, agricultural sectors rank low. In Nigeria, comparable investments would yield higher returns in some agricultural sectors than in oil.⁷

Figure 5 shows the welfare effects from 1 per cent factor-biased, technological progress in Nigeria. Technological improvements related to unskilled labour produce by far the highest returns in agriculture. Specifically, cattle, other livestock, fruits and vegetables have the highest returns. The implication is that these non-traditional agricultural export commodities such as cattle by-products (for example bonemeal, hides and skin), fruits and vegetables such as pineapple and plantains are high-value products capable of generating both employment and incomes. In manufacture, the highest returns are obtained from technological improvements related to capital.

Table 8 shows sectoral output effects that can be generated from a 1 per cent improvement in international and domestic transportation costs. International transportation improvements lower the cost of both Nigerian exports and imports. Examples include improvements in Nigeria's terminal facilities (for example ports and airports) as well as improvements in Nigeria's import and export procedures such as the ongoing port reforms through privatization that seek to increase the efficiency of operations.

The economy-wide (aggregate) effect of 1 per cent international transportation improvements is that Nigeria gains 0.06 per cent in welfare, around \$21 million. Exports and imports contribute equally to the welfare gains. The economy-wide

Table 7 Welfare gains from 1% sector-specific Hicks-neutral technological progress, by sector

Sector	Nigeria			Indonesia			Uganda			Zimbabwe		
	Output	EV	100* EV/Output	Output	EV	100* EV/Output	Output	EV	100* EV/Output	Output	EV	100* EV/Output
Paddy rice	335	3.41	1.02	5,120	48.47	0.95	32	0.40	1.23	13	0.02	1.01
Wheat	7	0.09	1.23	13	0.12	0.96	4	0.06	1.42	10	43	0.51
Other grains	919	9.60	1.04	824	7.09	0.86	322	3.20	0.99	27	189	1.93
Fruits, vegetables	5,181	52.78	1.02	5,210	47.69	0.92	1,655	16.65	1.01	26	143	1.12
Oilseeds	151	1.37	0.91	1,126	10.07	0.89	52	0.59	1.14	17	47	0.42
Sugar cane	7	0.08	1.10	843	7.94	0.94	86	1.04	1.20	14	117	0.99
Plant fibers	65	0.53	0.81	78	0.81	1.03	30	0.54	1.81	9	239	2.02
Other crops	201	1.56	0.77	4,860	40.93	0.84	273	5.18	1.90	8	1,082	10.27
Cattle	293	3.59	1.23	7	6.03	1.00	86	0.88	1.02	25	379	3.79
Other livestock	833	10.22	1.23	2,897	27.39	0.95	70	0.74	1.05	21	101	0.92
Dairy farms	53	0.65	1.23	4	1.74	1.63	235	2.40	1.02	24	9	0.09
Wool	1	0.02	1.28	2	0.64	0.98	0	0.00	3.30	1	119	1.21
Forestry	183	1.72	0.94	22	3,565	32.91	116	1.28	1.11	18	29	0.27
Fishing	427	4.14	0.97	21	3,040	25.02	128	1.31	1.03	23	19	0.14
Coal	1	0.01	1.22	8	2,995	23.31	10	0.10	1.04	22	56	1.15
Oil	14,263	142.72	1.00	19	8,800	83.25	78	1.50	1.91	7	0	0.00
Gas	1,478	19.62	1.33	1	5,693	62.50	1	0.00	2.21	6	0	0.00
Other MmrIs	156	0.92	0.59	29	4,786	31.13	19	0.14	0.77	29	481	5.52
Red meats	39	0.43	1.11	11	1,370	13.53	7	0.25	0.97	28	70	0.79
Other meats	48	0.36	0.76	27	2,654	25.67	10	0.23	2.34	3	145	1.47
Veg Oils	39	0.20	0.51	30	4,537	34.44	1	0.04	2.60	2	153	1.53
Dairy Prods	9	0.11	1.26	3	418	3.86	15	0.18	1.26	12	9	0.09
Proc Rice	20	0.06	0.28	31	6,239	59.33	27	0.35	1.32	11	37	0.37
Sugar manuf.	1	0.01	1.01	18	2,130	18.68	66	0.79	1.18	15	74	0.56
Other foods	328	2.63	0.80	25	10,711	87.31	118	1.40	1.18	16	819	7.91
Rev., Tobacco	156	1.10	0.71	28	5,734	48.21	269	2.03	0.76	30	1,009	9.62
TCF	825	8.23	1.00	20	21,481	185.99	55	1.25	2.28	5	770	8.38
Other Manuf	5,211	62.37	1.20	9	77,082	703.62	344	7.96	2.31	4	2,449	30.94
Utilities	2,359	27.38	1.16	10	25,025	413.36	1,039	6.72	0.65	31	1,133	19.04
Trade transport	8,775	96.60	1.10	12	30,536	308.65	1,391	15.10	1.09	20	2,547	26.61
Services	10,271	107.23	1.04	15	51,188	509.31	1,628	17.77	1.09	19	4,004	40.11

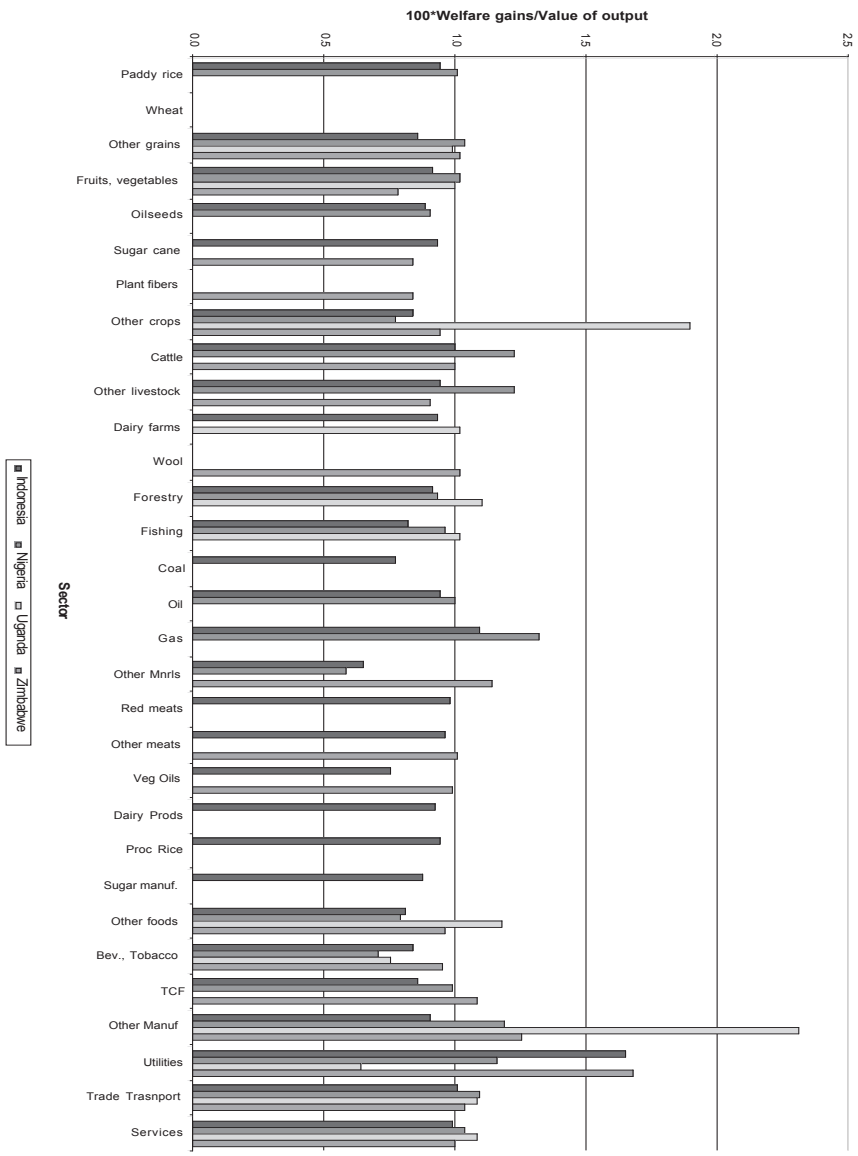


Figure 4 Welfare gains from 1 per cent sector-specific, Hicks-neutral technological progress, by sector.

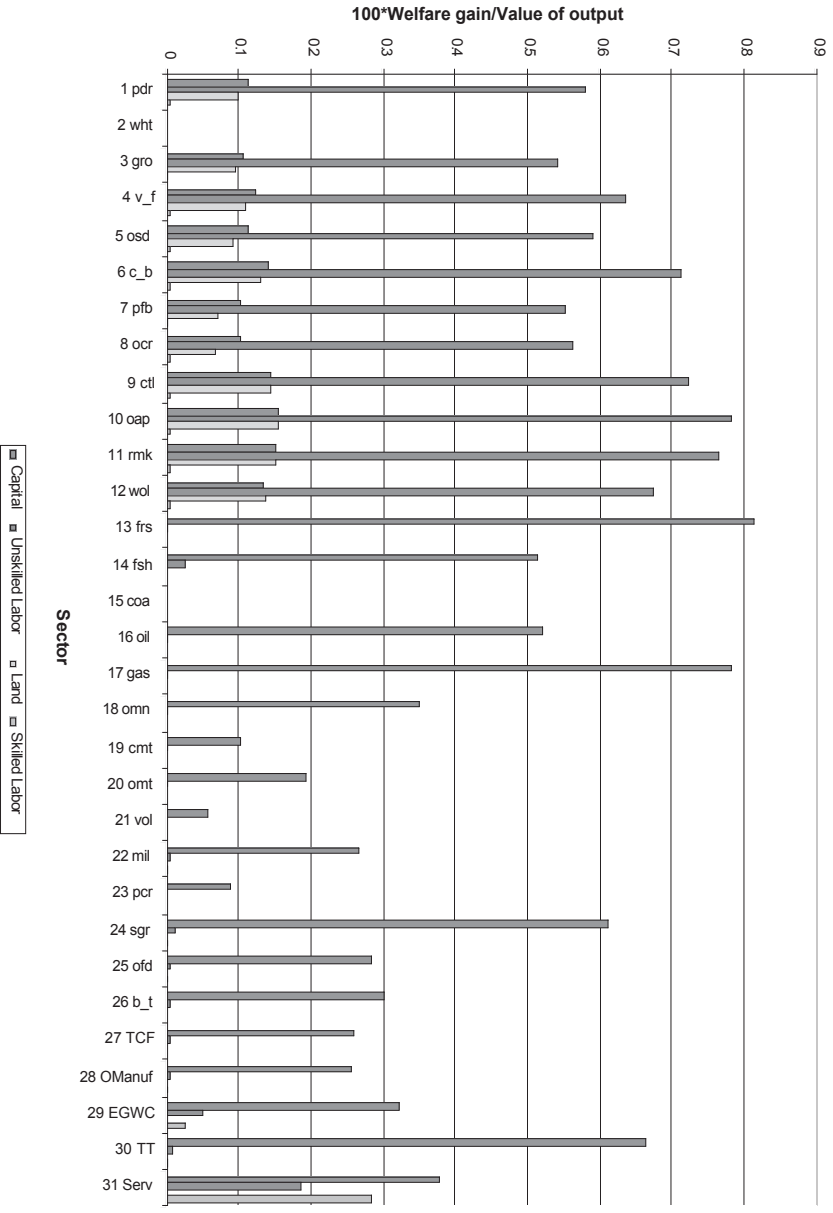


Figure 5 Welfare gains from 1 per cent primary factor-biased technological progress in Nigeria, by sector.

Table 8 Output effects from 1% cut in international and domestic transport costs in Nigeria

	international transportation		domestic transportation	
	Output		Output	
	%	million \$	%	million \$
Paddy rice	-0.01	-0.03	0.00	0.01
Wheat	-0.07	-0.01	0.29	0.02
Other grains	0.00	-0.03	0.05	0.50
Fruits, vegetables	0.00	0.17	0.01	0.69
Oilseeds	-0.03	-0.04	-0.11	-0.16
Sugar cane	-0.05	0.00	0.13	0.01
Plant fibers	-0.11	-0.07	-0.10	-0.06
Other crops	-0.09	-0.18	-0.50	-1.00
Cattle	0.03	0.08	0.22	0.65
Other livestock	0.06	0.48	0.23	1.91
Dairy farms	-0.03	-0.02	0.26	0.14
Wool	-0.03	0.00	-0.62	-0.01
Forestry	0.14	0.26	0.07	0.12
Fishing	0.02	0.11	0.13	0.54
Coal	-0.10	0.00	0.37	0.00
Oil	-0.01	-1.23	0.01	2.04
Gas	0.09	1.26	-0.04	-0.57
Other Mnrls	-0.09	-0.13	0.22	0.34
Red meats	0.17	0.06	0.17	0.07
Other meats	-0.14	-0.07	0.07	0.03
Veg Oils	-0.31	-0.12	0.04	0.02
Dairy Prods	-0.30	-0.03	-0.02	0.00
Proc Rice	-0.49	-0.10	-0.13	-0.02
Sugar manuf.	-0.14	0.00	-0.10	0.00
Other foods	-0.02	-0.06	-0.01	-0.04
Bev., Tobacco	-0.03	-0.04	0.22	0.34
TCF	-0.14	-1.19	0.39	3.25
Other Manuf	-0.10	-5.07	0.37	19.26
Utilities	0.00	0.08	0.20	4.64
Trade Transport	0.01	1.23	-0.33	-29.12
Services	0.00	0.16	0.08	7.81

effect of 1 per cent domestic transportation improvements is that Nigeria gains 0.17 per cent in welfare, around \$63 million. In practical terms, this includes better road networks, especially rural roads.

The agricultural sub-sectors that benefit the most from transportation improvements are fruit and vegetables, cattle and other livestock. Other manufacturing is the sector that benefits the most from domestic transportation improvements through more efficient supply of both raw materials and output. This is

not unexpected given the fact that transportation is one of the highest costs in processing and manufacturing.

Table 9 shows the output and trade effects of trade liberalization in Nigeria, in other words removal of all Nigerian tariffs in the GTAP model. The economy-wide effect of this policy change is that Nigeria gains 0.9 per cent in welfare, around \$342 million: the allocated efficiency gains are \$391 million, while the terms of trade deteriorate by \$51 million. The agricultural sectors that expand the most, in dollar terms, are other crops, cattle and other livestock. Exports of other crops increase by \$12 million, while imports of fruit and vegetables increase by \$22 million. The latter is due largely to the absence of competitiveness on the domestic front. In conclusion, Nigeria's participation in a global free trade agreement

Table 9 Output and trade effects from trade liberalization in Nigeria

	Output		Exports		Imports	
	%	million \$	%	million \$	%	million \$
Paddy rice	-2.2	-7	25.5	1	163.2	0
Wheat	-17.0	-1	51.4	0	-0.7	-2
Other grains	-2.3	-21	6.0	0	9.3	0
Fruits, vegetables	-0.9	-47	10.1	1	139.2	22
Oilseeds	0.2	0	9.4	2	27.1	0
Sugar cane	-9.1	-1	19.2	0	-12.4	0
Plant fibers	-9.0	-6	18.9	6	-9.3	0
Other crops	5.8	12	6.2	12	-3.3	-1
Cattle	2.3	7	14.5	0	9.0	5
Other livestock	2.7	23	4.8	0	40.1	4
Dairy farms	-8.7	-5	36.6	0	-29.8	0
Wool	32.0	0	32.7	0	-22.1	0
Forestry	-0.7	-1	0.7	0	3.7	0
Fishing	-7.3	-31	5.3	0	-8.0	0
Coal	-14.3	0	0.0	0	0.0	0
Oil	1.3	192	2.8	370	-15.6	0
Gas	-1.4	-21	-3.9	-34	87.8	0
Other Mnrls	-1.8	-3	2.9	3	2.3	1
Red meats	3.9	1	141.0	0	-4.3	-1
Other meats	-59.4	-29	29.4	0	116.0	26
Veg Oils	-61.0	-24	41.0	0	54.1	20
Dairy Prods	-11.9	-1	32.8	0	2.1	4
Proc Rice	-66.0	-13	13.4	0	2.8	11
Sugar manuf.	-0.7	0	11.4	0	-0.9	0
Other foods	-6.9	-23	14.7	18	7.0	30
Bev., Tobacco	-26.1	-41	13.0	4	28.0	34
TCF	-34.3	-283	66.0	108	39.7	348
Other Manuf	-14.3	-744	51.9	155	15.0	1,271
Utilities	6.0	142	30.6	79	-6.9	-1
Trade Transport	3.7	327	11.9	45	-5.0	-64
Services	-0.5	-55	10.6	64	-3.6	-84

would raise Nigeria welfare gains to 1.15 per cent, around \$434 million. So, it is in Nigeria's overall interest to continue trade liberalization.

1.7.3 Policy implications

This analysis confirms that there is great potential in investing in agriculture in Nigeria. While the longer-term strategy should be to restore the competitiveness of traditional export crops and high-value commodities, in the short run, the strategy of the government should be on improving the competitiveness of Nigerian agriculture in domestic and regional markets. Thus, policy-makers should focus their attention on the smallholder producers who constitute the majority of traditional crop producers in the country. But for the agricultural sector to take off, several actions should be taken. The public sector should:

- 1 Improve R&D investment in agricultural research. Currently, the low productivity of agriculture is a major constraint to agricultural growth in Nigeria. For agricultural productivity to improve, Nigeria's farmers need access to new technology. Technology alone will not solve the problem of low productivity, but it is a necessary condition. It is important for the government to revisit the R&D agenda and increase investments in agricultural R&D that lead to improved technologies. In particular, the government will also need to improve its research and extension services in order to improve the use of genetic materials and purchase inputs (World Bank, 2006a).
- 2 Improve markets, infrastructure and institutions. Fair, properly functioning markets and access to both inputs and food at reasonable prices are needed for poor Nigerian farmers to fully capture the benefits from access to improved technologies. Improved and timely access to credit, productive inputs (especially inorganic fertilizers) and extension services are needed; policies (like taxes and subsidies) that create distortions in capital markets to favour large enterprises and limit capital to small-scale farmers must be removed. Increasing investments in rural access roads and irrigation are also critical to reduce domestic costs. Market development efforts will benefit from public support in ensuring a favourable business climate and adequate infrastructure that provides reliable and reasonably priced transport, communication and power, and water services.
- 3 Improve irrigation capacity. Productivity in Nigerian agriculture is low, in part because of the low yield levels and the high yield variability associated with rain-fed agriculture that discourage farmers from investing in inputs such as improved seed, fertilizers and crop protection chemicals. Irrigation can serve as a powerful stimulus to agricultural growth by raising biological yield potential and increasing returns to investments in complementary inputs (World Bank, 2006a).
- 4 Strengthen the agricultural input supply systems. There will be no growth in agricultural productivity and exports unless Nigerian farmers increase their use of purchased inputs, especially improved varieties of seed, chemical fertilizers, crop protection chemicals, including pesticides, herbicides and

fungicides, and animal health-related products such as vaccines, medications and nutritional supplements. Strengthening input supply systems will ensure that these inputs are available in a timely fashion and at affordable prices (World Bank, 2006a).

1.8 Conclusion

Exports are an important driver of economic growth at the macroeconomic level. There is strong empirical evidence of a positive relationship between firm-level productivity and exports at the microeconomic level. Between 2000 and 2005, the value of non-oil exports declined at an annual average rate of about 9 per cent despite the fact that total exports were 53 per cent of GDP in 2005, largely as a result of oil and gas. The severe reduction in agricultural exports is further indication of the weak competitiveness of Nigerian agriculture. Agricultural exports fell from 2.5 per cent to 0.2 per cent of total exports between 1980 and 2005. Nigeria has lost market share for exports such as cocoa, palm oil and rubber. Non-traditional agricultural exports are limited. While agricultural exports have strengthened since 2000, performance is still far below the economy's potential.

This chapter has attempted to show the potential for agricultural export development in Nigeria. Nigeria has clear potential to earn more from agricultural exports both in traditional commodities such as cocoa, rubber, palm produce, cotton, hides and skins, crafts and textiles and in non-traditional ones. There are also immense opportunities to be tapped from the development of non-traditional exports such as non-timber forest products (NTFPs) including medicinal plants, snails, mushrooms, cultivated wildlife and so on. Some of these products are in high demand in North America, Europe and Asia where niche markets exist for them. Besides the diversification in foreign exchange revenue for the country, other economic opportunities in this sector include income generation and gainful employment at both production and value addition stages.

It is also very clear from Nigeria's past experience, generation of employment, infrastructure conditions and lessons from other developing countries that its agricultural export growth should be predicated on efficient small farms. The small farm can later develop into medium- and large-scale commercial farms by which time the business environment will be in a better position to support them. The experiences of large-scale operations that have failed in Nigeria are instructive in this respect.

This chapter supports the thesis that agricultural exports in Nigeria were a direct victim of, initially, the civil war and, later, the oil boom. The agricultural sector suffered serious discrimination and neglect from successive administrations, and no courageous or coordinated efforts to revive or resuscitate the sector were made until 1999 when the current administration embarked on far-reaching reforms. Empirical evidence from our analyses has shown that agricultural exports can be as lucrative and profitable as any other sector of the Nigerian economy with respect to returns on investment. Therefore, the discrimination against agriculture should disappear, and investment should be channelled to agriculture

because it has high potential for employment, food security and exports. The present government is doing a good job in terms of reforms and making Nigerian exports competitive through various incentives. The Nigerian economy has expanded at a fast pace since 2000. Non-oil GDP has grown at an annual average rate of 5.8 per cent. In the past two years, non-oil growth accelerated, reaching 7.4 per cent in 2004 and 8.2 per cent in 2005 (World Bank, 2006b). But the productivity and competitiveness of the non-oil economy, and particularly agriculture, have been declining over the years. The reform agenda should be systematic and sustained irrespective of the professional background of the successive presidents of the country. In the short run, the strategy of the government should be to improve the competitiveness of Nigerian agriculture in domestic and regional markets (World Bank, 2006b). As agricultural growth will continue to be led by smallholder farmers, policy-makers should take bold action to: (i) improve R&D investment in agricultural research; (ii) improve markets, infrastructure and institutions; (iii) improve irrigation capacity; (iv) strengthen the agricultural input supply systems. These actions will go a long way to improving agricultural growth and exports. A longer term strategy would be to restore the competitiveness of traditional exports and promote newer, high-value crops. For this to succeed, improvement in the investment climate will be crucial so that large-scale investment can be made.

Notes

- 1 The views expressed in this chapter are those of the authors and do not necessarily represent those of the World Bank, the Central Bank of Nigeria, the Federal University of Technology, Akure, or any of their officials.
- 2 Named after events that occurred in the Netherlands during the 1970s following the discovery of natural gas under the North Sea, Dutch disease is an economic phenomenon that can be triggered by sudden large inflows of foreign currency. Dutch disease is often associated with exports of a natural resource (typically oil or natural gas) but, strictly speaking, the foreign currency inflows can come from any source, including remittances, foreign aid or even taxes. In a country afflicted by Dutch disease, the inflows of foreign currency cause the value of the country's currency to rise, making domestically produced manufactured goods and agricultural commodities less competitive compared with imported goods and commodities. Imports consequently increase, and non-resource exports decrease, resulting in reduced domestic economic activity. Dutch disease weakens the economy when the sectors that are crowded out are vital to the country (see World Bank, 2006b).
- 3 The GTAP framework is fully documented in Chapters 2–5 of Hertel (1997) and in Dimaranan and McDougall (2005). Further details on the GTAP model can be found in www.gtap.org.
- 4 The GTAP model is solved using the GEMPACK suite of software (Harrison and Pearson, 1994).
- 5 In a production function framework, technological change is Hicks neutral when it does not affect the optimal choice of inputs. We implement Hicks-neutral productivity changes by shocking the exogenous GTAP variables $aoall_{it}$, $i \in PROD_COMM$ and $r \in REG$.
- 6 The concept of factor-biased technical change was first introduced by Hicks (1932) to describe techniques that facilitate the substitution of other inputs for a specific production factor. He called techniques that facilitated the substitution of other inputs for

labour 'labour saving' and those designed to facilitate the substitution of other inputs for land 'land saving'. According to Heady (1949) and Hayami and Ruttan (1985: 75) *biological-chemical* innovations, such as hybrid seeds, fertilizers and pesticides, all tend to be yield increasing and thus substitute for land. In Hicks terminology, they are land saving. *Mechanical* technology can also have a yield effect when it permits more timely cultivation and an extension of multiple cropping, cultivation of soils or the use of irrigation pumps, but most mechanical technology is designed to make agricultural work less physically burdensome and to save the amount of labour needed to produce a unit of output; that is, it substitutes machines for labour and is therefore labour saving.

- 7 See Ehui and Tsigas (2005) for an attempt to prioritize investments in a general equilibrium framework.

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