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## AFRICAN AGRICULTURE MISUNDERSTOOD: POLICY IN SIERRA LEONE

The problems facing Black Africa in the development of its agriculture are in general rather different from those of Asia and Latin America. Keith Griffin (15) has recently reviewed some of the major issues involved in the non-African regions of the less developed world, where, he seems to suggest, they essentially revolve around factor and product price-distortion wrought both by governments and by the bargaining position of the larger landowner versus the smaller owner, the tenant and the landless. S. R. Lewis (30) while examining taxation policy has also emphasized the damaging effects of price-distortion induced by governments. Michael Lipton (31), among others, has argued that agricultural policies have favored those with economic power, whereas that power should perhaps have been channeled towards the relatively poor by taxation, land reform, or other means.

The major concerns in the area of African agricultural development have centered around policy towards agricultural exports, and, much more recently, the stagnation of per capita food production. On the whole, problems connected with the distribution of land and rural inequality have not entered the scene (although there are major exceptions as found in Kenya and Ethiopia for instance), because cultivated land is genuinely scarce only in limited areas. Economic policies have generally tended to look down on agriculture as something of secondary importance, or else as presenting problems too difficult to deal with. The significance of mineral exports has been exaggerated, while agricultural exports have been heavily taxed, often with little to show for it in terms of agricultural development.

The economic mechanism of agriculture in one African economy and the way in which policy has affected it are analyzed here. An attempt is made to draw conclusions of relevance to the whole of tropical Africa (and perhaps to other poor regions) as well as more particular conclusions.

Postwar policy towards agricultural exports, and especially the role of the Sierra Leone Produce Marketing Board (SLPMB), is discussed first. R. G. Saylor (40) presents an analysis of the Board's operations up to 1963, but some of his arguments are questioned here, and the conclusion reached is that the adverse effects of Marketing Board policies have been much greater than is generally realized. This conclusion, however, depends on considering a single country—a small producer and a price-taker. Questions of market share and the reactions

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of other producing countries need to be taken into account to arrive at more general conclusions and these are discussed in the closing paragraphs.

Secondly, recent policy towards the production of rice, the staple food of Sierra Leone, is examined. The major goal of this policy is evidently to save imports of rice, which have been fairly sizeable since the mid-1950s and show no signs of diminishing; but it is suggested that ignorance of certain important economic facts about agriculture in Sierra Leone has tended to prevent that goal from being achieved, and will continue to do so unless policy is changed.

#### AGRICULTURE IN THE SIERRA LEONE ECONOMY

The contribution of agriculture (and forestry, hunting, and fishing) to the Gross Domestic Product (GDP) in Sierra Leone is fairly low by African standards, being 34 percent in 1969/70 compared with, for example, 62 percent in Nigeria (1962), 47 percent in the Ivory Coast (1961), 50 percent in Ghana (1961), and 58 percent in Uganda (1966).

Mining and quarrying are unusually important and provide the main reason for the small agricultural contributions, while the particular enterprise that makes mining so significant is diamond production. Mining and quarrying accounted for 18.4 percent of GDP in 1969/70, of which diamonds made up approximately one-half. About half of the diamond output comes from a labor-intensive, alluvial sector; the other half is produced by the National Diamond Mining Company (formerly Sierra Leone Selection Trust) using highly capital-intensive techniques. The structure of exports and the relative contributions of agriculture and the mining sector are shown in Table 1, where it is seen that again the latter appears to dominate the scene; and again, this is untypical of Africa as a whole.

The true importance of the mining sector, however, is probably much less than the statistics seem to indicate. There is a tendency for factor incomes in the mining sector either to flow directly out of the country because the factor owners are foreign, or to be spent to a large extent out of the country, because those incomes tend to be high and the demands they generate cannot easily be met domestically. Furthermore, the mining sector does not supply its outputs as inputs

TABLE 1.—VALUE OF SIERRA LEONE EXPORTS, 1970\*

Commodity	Thousand leones	Percent of total	Commodity	Thousand leones	Percent of total
Minerals			Agricultural		
Diamonds			Palm kernels	7,003	8.4
Alluvial	27,445	33.0	Coffee	4,322	5.2
Other	23,508	28.3	Cocoa	3,319	4.0
Total	50,953	61.3	Piassava	482	0.6
Iron ore	10,534	12.7	Ginger	354	0.4
Bauxite	1,536	1.8	Kola nuts	120	0.1
Rutile	1,904	2.3	Total	15,600	18.8
Total	64,927	78.1	Other	2,658	3.2
			Grand total	83,185	100.0

\* Data from *Bank of Sierra Leone Economic Review*, 1971. In 1970, one leone was equivalent to U.S. \$1.20, or to one-half pound sterling.

to other internal industries, nor does it use much in the way of domestically produced purchased inputs (see 8). Thus, the multiplier and linkage effects of the mining sector relative to the agricultural sector bear little relation to its statistical contribution to GDP. Similar observations apply to the relative contributions to export earnings; the gross figures shown in Table 1 are out of proportion to the relative net contributions. A. Killick and R. W. Daring, in estimating the net surplus on current account generated by the mining companies from 1963 to 1965, reach the following conclusion (26, pp. 280-81):

While no particular significance can be attached to the precise figures . . . the results establish that taking into account the imports and transfers of company employees and the enlarged import bill arising from company payments to the government and other sectors of the economy has the result of greatly reducing the surplus derived from the mining companies. *The aggregate surplus . . . is a mere 12 percent of the value of the companies' exports.*

Of course, these qualifications to the GDP and export statistics apply less in the case of the labor-intensive diamond-mining sector. It might be felt that the labor involved earns high incomes and that therefore that sector too has a high propensity to import, but the nature of Sierra Leonean society (as in much of tropical Africa) probably ensures that the earnings become fairly well spread out among relatives. Killick and Daring estimate the net surplus generated to be between a third and a half of gross export earnings (26, p. 285). In contrast, both food production and export production will have stronger linkages with other sectors, particularly with the transport and trading sectors, which accounted for 21 percent of GDP in 1969/70.

Government spending on agricultural development in Sierra Leone has been a small proportion of total expenditure, and if one takes into account the revenue obtained from the Marketing Board's surpluses and taxes on agricultural exports, the net flow of money has usually been out of the agricultural sector, averaging Le. .67 million, 1955-71. Gross expenditure on agriculture in recent years which has averaged about 3 to 4 percent of total Government expenditure, is shown in Table 2, along with the trading surpluses of the Marketing Board and export duties paid by the Board.

It is true that the Marketing Board spent some of its surpluses on attempts to develop agriculture, especially during the mid-1960s, but these were on the whole complete failures financially (see below), so they are left out of account altogether in considering expenditure on agriculture in the table. To see how this apparent exploitation of the agricultural sector has affected economic development, it is first of all necessary to analyze the mechanics of the supply of agricultural exports; secondly, we look at how the Produce Marketing Board has influenced producer prices and thus the supply of exports; thirdly, we look at the economics of food production in order to be in a position, fourthly, to assess the effectiveness of government efforts in that field.

#### THE SUPPLY OF THE PRINCIPAL AGRICULTURAL EXPORTS

##### *Palm Kernels*

Palm kernels might be said to have one of the simplest of all production functions, virtually the only input being the amount of time put into the cracking of

TABLE 2.—AGRICULTURAL EXPORT DUTY REVENUE, PRODUCE MARKETING BOARD SURPLUSES AND GOVERNMENT EXPENDITURE ON AGRICULTURE, SIERRA LEONE, 1950-72\*  
(Million leones)

Year	Export duty revenue	Marketing Board surplus <sup>a</sup>	Total revenue from agriculture	Government expenditure on agriculture <sup>b</sup>	Net flow from agriculture
1950	.44	1.66	2.10	...	...
1951	.76	3.05	3.81	...	...
1952	1.96	.81	2.77	...	...
1953	1.82	.21	2.03	...	...
1954	1.61	.21	1.82	...	...
1955	1.22	-.24	.98	.65	.33
1956	1.05	-.36	.69	.90	-.21
1957	.74	-.11	.63	.99	-.36
1958	1.02	.49	1.51	1.49	.02
1959	1.02	1.67	2.69	1.32	1.37
1960	1.05	.55	1.60	.83	.77
1961	.68	-.40	.28	1.00	-.72
1962	.23	-.18	.05	1.08	-1.03
1963	.57	.88	1.45	1.21	.24
1964	.75	1.61	2.36	1.75	.61
1965	.84	1.68	2.52	2.43	.09
1966	1.13	1.50	2.63	1.84	.79
1967	.33	-1.84	-1.51	1.04	-2.55
1968	1.71	5.33	7.04	1.14	5.90
1969	1.86 <sup>c</sup>	1.40	3.26	1.93	1.33
1970	2.47 <sup>c</sup>	3.60	6.07	1.82	4.25
1971	2.16 <sup>d</sup>	0.62	2.78	2.18	.60
1972	3.99 <sup>c</sup>	3.09	7.08	...	...

\* Data for export duty revenue from Sierra Leone, Central Statistics Office, *Annual Trade Reports* and its *Annual Statistical Digest*, 1968 (only one issue produced); *Sierra Leone Trade Journal*, various issues.

Data for the Marketing Board surplus from Sierra Leone Produce Marketing Board, *Annual Reports*, 1949-63, and estimates for 1964 and following.

Government expenditure on agriculture: *Bank of Sierra Leone Economic Review*; *Sierra Leone Statistical Bulletin* (formerly *Quarterly Statistical Bulletin*).

<sup>a</sup> 1961 refers to the first half only. 1962 and 1963 are in fact 1961/62 and 1962/63 (mid-year to mid-year). The figures for 1964 onward are estimates of surpluses on palm kernels, cocoa, and coffee only. These estimates are obtained as follows. Board revenue is assumed to be the same as f.o.b. export value. Costs consist of: (a) payments for produce, which are obtained by multiplying producer prices by quantities purchased; (b) buying agents' allowances, obtained from M. G. Fenn, *op. cit.*, or estimates based on actual figures; (c) export duty revenue (sources above); (d) marketing costs (transport, storing, and so on), obtained by estimating cost functions using marketing cost and quantity data from SLPMB *Reports*, 1949-63. (These functions fitted the data quite well.) The estimates are most sensitive to errors in estimated sales and purchases whose values are big enough to outweigh the other components of the calculation.

<sup>b</sup> This is spending on Agriculture, Forestry, and Fishing, 1955-59, and spending on Agriculture and Natural Resources, 1960 onward. 1955, 1956, and 1957 are for calendar years, 1958 is in fact 1958/59 and beyond. The dates of the accounting year changed from April 1 through March 31 to July 1 through June 30 in the mid-1960s.

<sup>c</sup> Excludes duty on kola nuts and bennised (c. Lc. 10,000 to 20,000).

<sup>d</sup> Estimated by applying duty rates given in Fenn (12).

the nut shells. There is no question of peasants planting palms for the purpose of palm kernel production, at least in recent years, although there may have been planting in the past,<sup>1</sup> nor even of climbing up to gather the palm fruit for the kernels, because that operation is carried out primarily for the purpose of extracting palm oil from the outer flesh of the fruit, while any kernels are obtained as a by-product. (Not necessarily all the nuts left from the oil extraction process are cracked for the kernels.) A great many nuts are also picked up casually from the ground, where the fruit has fallen and rotted away (39, p. 22). Capital equipment, if such it may be called, consists of two stones per unit of labor.

It seems likely that transport costs are an important factor affecting the supply of palm kernels, and the other export crops too. To begin with, a glance at an appropriate map gives the impression of a clustering of production along the main lines of communication with Freetown (5), and indeed, the main *raison d'être* of the railway in the early days was to tap the rich oil palm areas inland. But there are two other stages in the transporting of kernels, before they are railed—or nowadays trucked—to Freetown, namely, the movement by traders to the major buying centers where the Marketing Board's agents pay the so-called producer price, and before that, the head-loading from the villages to larger villages on road routes where the traders have established their shops.<sup>2</sup> Little is known about costs of head-loading, but R. Galletti *et al.* (13, p. 51) suggest an average of about 80 new pence per ton-mile for Nigeria in 1951, which it seems reasonable to apply to Sierra Leone at the same time. The producer price in that year was £28.90 per ton, so given that the true producer price was less than the so-called one paid to traders, head-loading of a few miles must eat away much of any return to the villager.<sup>3</sup> It may be then that the response of palm kernel output to changes in the "producer price" is the response of the trader and his helpers traveling further (assuming a price increase) afield to collect, or else the response of villagers themselves in carrying kernels from greater distances to the traders, as much as response in terms of changes in labor applied to the cracking of nuts. In other words, supply response may be a change in the number of supplying villages as much as a change in the amount supplied per village.

The data used to estimate palm kernel supply functions are Marketing Board purchases (and actual exports, 1946–49) and "up-country buying station" prices deflated by the Freetown Consumer Price Index. The use of the Freetown Consumer Price Index as a deflator of money producer price exaggerates slightly the downward trend in real prices because it contains prices of housing, which have a weight of about 23 percent and which have gone up rather more than other prices. Prices of Freetown housing would hardly affect the decisions of export

<sup>1</sup> This is in contrast to plantations, of which there are few in Sierra Leone, with a very small contribution to total supplies.

<sup>2</sup> This is the system of marketing described by V. R. Dorjahn (9) in relation to the Magburaka area in the central part of Sierra Leone.

<sup>3</sup> G. A. Petch notes: "in 1946 the District Commissioner for Kono observed that the local price of 3s/6d to 4s/- per bushel for kernels was no incentive, particularly to producers who had to head-load their kernels for two or three days with a correspondingly long journey back" (39, p. 102). Furthermore, it is likely that the monopoly and monopsony power of traders increases with the distance and remoteness of villages from buying centers: "In my stay in Sierra Leone I did encounter one or two cases in extremely remote places where traders, both African and Lebanese were in a strong bargaining position and appeared to have forced prices up to a point which reduced their own turnover and was against their own interest" (39, p. 99).

TABLE 3—PALM KERNEL SUPPLY FUNCTIONS, SIERRA LEONE, 1964-72\*

(1)	$Q = 1,161 + 787P - 106R + 308T,$ (9.02) (1.85) (1.94)
	where $Q$ is quantity supplied in tons, $P$ is deflated producer price in 1961 leones, $R$ is annual inches of rainfall at Daru Station in the Eastern Province, $T$ is time in years, and the figures in brackets are $t$ ratios.
	$R^{*2} = .86 \quad D = 2.06$
(2)	$Q = 16,640 + 654P$ (11.41)
	$R^{*2} = .83 \quad D = 1.44$
(3)	$\text{Log } Q = 8.0 + .8 \log P$ (10.01)
	$R^{*2} = .79 \quad D = 1.3$
(4)	$\text{Log } Q = 8.8 + .8 \log P - .2 \log R + .04 \log T$ (9.54) (2.04) (1.57)
	$R^{*2} = .82 \quad D = 1.9$

\* For Liberia, the following equation has been estimated, 1950-60:  $\text{Log } Q = 3.7 + 1.1 \log P$  (6).

crop producers. The statistical result of this is that the price coefficients and elasticities will be slightly underestimated, which will in fact make the conclusions reached later on slightly conservative. Table 3 gives the main regression results. An increase in the real price by Le. 1 per ton appears to increase palm kernel supply by about 650 to 800 tons, representing an elasticity of about 0.8.

#### *Cocoa and Coffee*

The estimation of cocoa and coffee supply functions is as difficult as that of palm kernel functions is simple. This is essentially because cocoa and coffee are planted tree crops, having a gestation period of some years before the first harvest. Two distinct economic decisions are thus made by the producer, the first being a planting decision depending on expected prices several years hence, the second being a harvesting decision depending on current prices, and the stock of trees. The absence of any data on the stock of bearing trees presents perhaps the gravest problem for the econometrician (as if there were not enough problems anyway). However, disbelief may be suspended over the following approach. It is assumed that at the time of planting there is a certain desired stock of bearing trees for the time of first harvesting of the newly planted trees, and that the planting is carried out so as to make the actual future stock (equal to the current stock, plus a depreciation allowance, plus the newly planted stock) equal to the desired future stock. This desired stock is assumed to be a function of expected future prices (from the time of first harvesting onward). Expected future prices (including those of competing crops) are assumed to be a function of prices at planting time and perhaps in the recent past, or even of all past prices (34).

Put algebraically,

$$B_t^d = (P_t^*) \quad (1)$$

where  $B_t^d$  = desired stock of bearing trees (desired *at* the time of planting,  $t - k$ ,

where  $k$  is the gestation period, for the time of first harvesting,  $t$ )  $P_t^*$  = expected real prices at first harvest (and beyond).

$$B_t = B_t^a \quad (2)$$

where  $B_t$  = actual stock of bearing trees at time  $t$ .<sup>4</sup>

$$P_t^* = c(P_{t-k}) \quad (3)$$

The harvesting function at time  $t$  is:

$$Q_t = d(P_t, W_t, B_t, t, u_t) \quad (4)$$

where  $W_t$  = current weather factors, time,  $t$ , is included to allow for increasing yields through time, and  $u_t$  is a random element.

From (1), (2) and (4) we obtain the equation to be estimated by least squares regression:

$$Q_t = f(P_t, W_t, P_{t-k}, t, u_t).^5 \quad (5)$$

Numerous regression experiments were run, testing variants of this form of equation, including, for example, different lags for  $P_{t-k}$ , moving averages of lagged prices, prices of competing crops, etc. The data used were Marketing Board purchases and actual exports where purchases were unavailable (especially for coffee), and up-country buying station prices or else two-thirds of the annual average export price for coffee during the period when it was not purchased by the Board. The time period covered was 1946–71. Inevitably one has to compromise in view of the small number of observations, and it turned out that a lag of seven years in the case of cocoa and six years in the case of coffee seemed best for the gestation period.<sup>6</sup> A major drawback in the case of cocoa is the fact that the purchases are clustered in the late months of a calendar year and the early months of the following year. Ideally, data are needed for the season but were only available for calendar years. Thus, the coefficient of current price is particularly suspect. Rainfall in the months before harvest and relative humidity are considered to be the most important climatic factors affecting yields, but it turned out that the latter hardly varied at all, so rainfall alone was tried.

The cocoa regressions with the variables expressed in natural numbers were generally superior to those in logarithmic form, while the reverse is true for coffee. The following seemed to be the equations most worth reporting, on the basis of explanatory power, statistical significance and *a priori* reasons:

$$Q_t^c = 78.0 + 8.7R_t + 5.9P_t^c + 6.6P_{t-7}^c - 61.5P_{t-7}^k + 160.4t$$

(.74) (1.66) (2.85) (2.16) (2.38)

where  $Q^c$  = supply of cocoa,  $R$  = annual rainfall at Daru Station,  $P^c$  = price of

<sup>4</sup> More generally, we could make  $B_t$  a stochastic function of  $B_t^a$ , but this would not affect what follows.

<sup>6</sup> For a discussion of various models—different from this one—and their application to cocoa and coffee supply, see I. A major drawback in all these models is that no allowance is made for the theoretical asymmetry of the planting function: if  $B_t^a < B_{t-k}$ , new planting (investment) will not be negative, i.e., uprooting will not be significant, except for a small depreciation element due to aging and diseased trees.

<sup>6</sup> Miss Ady (I), and others to whom she refers, actually included a 12-year lag as well, to allow for another yield peak after that length of time from planting. This drastically reduces the number of degrees of freedom, however.



cocoa (deflated),  $P^k$  = price of palm kernels,  $t$  = time, and figures in brackets are  $t$  ratios.

$$R^{*2} = .58, \quad d.f. = 13, \quad D.W. = 2.36$$

The coefficients and degrees of significance of the same variables in other equations tended to be similar, and  $R^{*2}$  did not go as high as .7.

$$\text{Log} Q_t^P = -30.2 + 1.2 \log R_t + 3.4 \log P_t^P + 1.5 \log P_{t-0}^P + 2.7 \log t$$

( .81)                      ( 4.72)                      ( 2.90)                      ( 8.71)

where  $Q^P$  = supply of coffee,  $P^P$  = price of coffee

$$R^{*2} = .82, \quad d.f. = 15, \quad D.W. = 1.85$$

Again, degrees of significance and coefficients in other equations were not dissimilar to these and  $R^{*2}$  was always less than 0.9.

#### THE SIERRA LEONE PRODUCE MARKETING BOARD

The African marketing boards developed during the 1940s out of special trading arrangements that were established during the war, and various reasons were put forward as justification for their continuance: for example, to weaken the grip of oligopolistic trading companies, to reduce the number of superfluous middlemen, and to stabilize producer prices.

In 1954 P. T. Bauer published his *West African Trade* (2), part of which was concerned with the marketing boards and was very critical of them (see also 3). He claimed that trade in agricultural exports was highly competitive and that middlemen could not have made large profits, that price stabilization would not stabilize incomes but would reduce them (and in the 1963 reissue of his book he pointed out that the boards had, in any case, long ago abandoned any pretense that they were much more than tax-collecting agents), that low prices would inhibit the expansion of production, and that the whole policy was inequitable since it taxed one particular section of the community and hit the marginal producers (perhaps those furthest from the buying centers) harder than the rest.

G. K. Helleiner (18), however, rallied to the defense of the boards, not in their role as stabilizers and marketing reformers, but rather as efficient tax collectors. He argued that if the authorities spent the marketing surpluses and export taxes on productive investments, such as roads, which would benefit agriculture, then they could not be criticized on equity grounds, and must be praised for being more farsighted than the individual producers. The fact that the projects upon which funds had in fact been spent may often have been very far from economically sound, was beside the point; any government could mismanage its spending, but the principle still held. In fact, Helleiner put the case more strongly (18, p. 603):

The disposition of Marketing Board surpluses may not have been perfect, but the rates of return from their investments in research, roads, agricultural schemes, universities, modern manufacturing plants and so forth are unlikely to have been any lower than those on housing, sewing-machines, land clearing and other small-scale outlets for peasant funds discussed above, let alone so much lower to offset the difference between con-

sumption ratios. It can therefore unambiguously be stated that Nigerian development has been aided through the device of channelling a portion of its export earnings via the Marketing Boards away from the producer to other (governmental) decision-makers.

He paid scant attention to the supply-inhibiting effects of the transfer of resources and to the fact that the resulting fall in income might be greater than the forced savings transfer because of an increase in leisure and other activities.

Saylor (40) discusses this aspect to some extent, noting that all export crops handled by the Sierra Leone Board except cocoa had declined in output up to 1964,<sup>7</sup> and claiming that production of subsistence crops had increased as a result of Marketing Board policies: "Sierra Leonean farmers have found 'subsistence' farming more profitable than 'export' farming; consequently a reallocation of resources toward subsistence farming and away from export farming has occurred" (40, p. 123). This interpretation is probably wrong. Although it may be true that "subsistence" production increased, population and the agricultural labor force increased as well, so one would expect an increase in production; in fact, as we shall see, the evidence is that food production *per head* has not grown. Also, it is likely that cash crop production is at the expense of other activities and leisure rather than food production (to any extent, at least) (20, 36, 37). Further, it is illogical to blame on low producer prices the decline in the production of export crops other than cocoa and coffee. The above statistical analysis shows (and it seems likely *a priori*) that palm kernel supply depends mainly on real producer prices, so certainly *current* production will be lower if current real prices are lower; but a *decline* in production could only be brought about by a decline in real price, which has indeed occurred, but because of world market forces, not the SLPMB. In fact, however, although cocoa production did not decline, it probably would have increased more in the absence of the Board's policies and government export duties. This is because low producer prices not only inhibit current output but also the planting of cocoa trees, and therefore output for some years into the future. (Cocoa trees bear for thirty years or more).

Using the supply functions estimated above it should be possible to get some idea of the effects on supply, "producer" prices, "producer" income and export values, of the Marketing Board surpluses and export duties, especially in the case of palm kernels whose supply function is eminently straightforward, and which is dealt with first.<sup>8</sup> To arrive at what the producer price would have been in the absence of intervention,—the "free" producer price (F.P.P.), or what Helleiner calls the "implicit world price" (19)—we simply add the Marketing Board surplus per ton and export duty revenue per ton to the actual producer price per ton.<sup>9</sup> The relevant figures are given in Table 4. To estimate what the quantity supplied would have been, the free prices (deflated) are applied to the supply func-

<sup>7</sup> Coffee, which, like cocoa, increased over the period, was not purchased by the Board from 1953 until 1962.

<sup>8</sup> F. S. Idachaba (21) has analyzed the effects of export taxation on resource use in Nigeria, and D. Olatunbosun and S. O. Olayide (38) have made some attempt to estimate losses in cocoa producers' income.

<sup>9</sup> In cases where there was a net subsidy of a product, i.e., a Board loss not offset by export duty, this procedure gives too low a figure for the free price, which has to be calculated by a slightly more complex method (see footnote e, Table 4).

TABLE 4.—ESTIMATION OF THE SUPPLY-INHIBITING EFFECTS OF TAXING PALM KERNELS, SIERRA LEONE, 1950-72\*  
(Leones per ton at current prices, except as otherwise indicated)

Year	Marketing Board profit or loss <sup>b</sup>	Export duties	Actual producer price	"Free" producer price <sup>a</sup>		"Free" supply response (tons)	Deflated actual producer price (1961 leones) <sup>c</sup>	Actual supply response (tons)
				(Current leones)	Deflated (1961 leones)			
1950	18.54	5.00	42.43	65.99	134.94	104,890	86.81	71,269
1951	30.82	6.82	57.80	95.44	145.93	112,078	88.38	74,854
1952	6.84	22.70	63.25	92.79	122.57	97,455	83.55	75,870
1953	1.72	18.20	63.25	83.17	111.04	89,260	84.45	69,525
1954	-2.68	15.48	63.25	76.05	96.38	79,673	80.16	68,562
1955	-3.26	12.18	57.80	66.72	77.85	67,554	67.44	57,445
1956	-0.94	11.26	57.80	68.12	75.94	66,305	64.44	58,100
1957	0.44	7.98	57.80	66.22	67.98	61,099	59.34	52,899
1958	4.82	8.00	57.80	73.62	78.48	67,966	61.62	53,694
1959	27.82	8.30	63.20	99.32	105.88	85,886	64.82	57,444
1960	11.58	13.16	63.20	87.94	91.60	76,546	65.83	54,442
1961	(-7.74) <sup>d</sup>	10.80	63.20	...	...	...	63.20 <sup>d</sup>	59,558 <sup>d</sup>
1962	-5.34	2.36	63.20	62.58 <sup>e</sup>	63.16 <sup>e</sup>	57,946	63.77	60,633
1963	8.90	4.10	54.20	67.20	67.26	60,628	54.25	51,540
1964	11.56	6.76	59.62	77.94	69.96	62,394	53.52	52,000
1965	24.34	11.52	59.62	95.48	81.96	70,242	51.18	49,300
1966	20.25	11.36	63.62	95.23	78.31	67,855	52.32	44,900
1967	-42.44 <sup>f</sup>	3.08	50.00 <sup>g</sup>	15.47 <sup>e</sup>	12.13 <sup>e</sup>	24,575	39.22	35,700
1968	62.18	15.94	63.22	141.34	109.40	88,188	48.93	54,000
1969	9.81	10.30	65.00	85.11	63.71	58,306	48.65	52,200
1970	27.16	12.24	65.00	104.40	72.65	64,153	45.23	57,200
1971	20.75	11.60	65.00	97.35	69.34	61,988	46.30	51,000
1972	-33.21	32.69	65.00	64.74 <sup>e</sup>	44.38	45,656	44.55	46,000

\* Basic data are from Sierra Leone Produce Marketing Board (SLPMB), *Annual Reports*, 1949-63; and from various issues of Sierra Leone, Central Statistical Office, *Sierra Leone Trade Reports* and *Sierra Leone Statistical Bulletin*; also *Sierra Leone Trade Journal*, *Bank of Sierra Leone Economic Review*, and *Tropical Products Quarterly*. (See text for method of calculation.)

<sup>a</sup> Sum of first three columns.

<sup>b</sup> 1964-70 are estimates. See footnote a, Table 2.

<sup>c</sup> Deflated by the Freetown Consumer Price Index.

<sup>d</sup> Figures for the first half only of 1961 are available. The figure for tonnage is obtained by doubling that for the first six months.

<sup>e</sup> "Free" producer prices are not estimated simply by addition when there is a net subsidy. Instead, the process involves a quadratic equation in the deflated free price, eliminating the negative root.

<sup>f</sup> It may be that the loss per ton in 1967 was smaller than shown. Different sources, purporting to give the same statistics in fact show different figures, and for 1967 those differences are quite large (especially for Board purchases), although in other years they were not big enough to have a significant effect on the estimates.

<sup>g</sup> This is a rough average figure for the year, as the actual price varied.

TABLE 5.—ESTIMATED PRODUCER LOSS ON PALM KERNELS, SIERRA LEONE, 1950-72\*  
(Constant 1961 leones)

Year	"Free" producer receipts	Actual producer receipts	Loss in producer's income	PMB Surplus and export duty	Rate of "disreturn" <sup>a</sup> (percent)
1950	14,153,856	6,200,403	7,953,454	3,184,016	150
1951	16,355,543	6,675,152	9,680,391	4,361,361	122
1952	11,945,059	6,373,060	5,571,979	2,712,396	105
1953	9,911,430	5,840,100	4,071,330	2,142,109	90
1954	7,678,884	5,484,960	2,193,924	1,106,365	98
1955	5,259,079	3,848,815	1,410,264	600,714	135
1956	5,035,202	3,718,400	1,316,802	668,033	97
1957	4,135,510	3,121,041	1,032,469	458,495	125
1958	5,333,972	3,329,028	2,004,944	758,232	164
1959	9,093,610	3,733,860	5,359,750	2,170,913	147
1960	7,011,614	3,593,172	3,418,442	1,416,267	141
1961	...	...	...	...	...
1962	3,659,869	3,880,512	-220,643 <sup>b</sup>	-220,643	0
1963	4,077,839	2,783,160	1,294,679	810,585	60
1964	4,365,084	2,783,040	1,582,044	855,081	85
1965	5,757,034	2,523,174	3,233,860	1,517,454	113
1966	5,313,725	2,349,168	2,964,557	1,167,403	154
1967	298,115	1,400,154 <sup>c</sup>	-1,102,039 <sup>b</sup>	-1,102,039	0
1968	9,647,767	2,642,220	7,005,547	3,265,263	115
1969	3,714,675	2,539,530	1,175,145	786,078	50
1970	4,660,715	2,587,156	2,073,559	1,568,546	32
1971	4,298,248	2,361,300	1,936,948	1,650,200	17
1972	2,025,500	2,049,300	-23,800 <sup>b</sup>	-23,800	0

\* Based on data used in or to calculate Table 4 (see text).

<sup>a</sup> The rate of return on funds if they had been left with the agricultural sector. Column 3 minus column 4 as a percent of column 4.

<sup>b</sup> Gain.

<sup>c</sup> Approximate.

tion, giving the quantities shown.<sup>10</sup> The function used was equation (2) in Table 3. By multiplying these quantities by the free prices we obtain the producers' receipts in the absence of intervention as shown in Table 5, and by then subtracting the actual producers' receipts we get producers' income losses as a result of intervention. These averaged about Le. 3 million per year at constant prices and in some years were greater than the actual producers' receipts. The last column of Table 5 shows the rate of "disreturn" on the funds obtained by Marketing Board and Government taxation of palm kernels, i.e., the rate of return on the funds if they had been left with the agricultural sector. This has often been over 100 percent. However, the method of calculation ignores the cost of the extra resources that would have been used to produce greater supplies in the absence of intervention. It is possible to argue that that is not unreasonable if

<sup>10</sup> The use of a regression equation for estimation beyond the range of data applied in the regression is hazardous. However, the equation is a reasonable fit and the scatter of real price against quantity suggests nothing other than a straight line. There is also the question of whether there is enough capacity to produce *in fact* such relatively high outputs. The evidence is that the capacity is there, for in 1936 a record 85,000 tons of kernels were produced, with a smaller population and labor force than postwar, and even as long ago as 1917, 58,000 tons were exported. Also, if we apply the average yield per tree to the number of bearing oil palms, as given by the *Agricultural Statistical Survey (41)*, we get a capacity production of at least 150,000 tons.

most of the opportunity cost was lost leisure, which some might consider of small value, or possibly even negative value ("unemployment"). After all, economic growth measures would only take into account the gross income involved. Also, it is likely that income accruing to agricultural producers would be more equitably distributed than if the same income went to other parts of the economy, which in itself might be considered of positive value. At the other extreme, it could be argued that we should subtract the area under the supply curve between the "free" supply and the actual supply to obtain the net loss to producers as a result of intervention. No doubt the true loss is somewhere between these two extremes, but even if the latter is done, the estimated losses and rates of disreturn are still high, as shown in Table 6. Rates of return much greater than this elsewhere in the economy would thus have to be obtainable to justify the taxation of palm kernels. While all these figures should only be treated as orders of magnitude, it is clear that the economic damage inflicted by interventionist policy has been great. So much for Professor Helleiner's unambiguous statement!

The loss in export earnings as a result of inhibiting supplies by low pricing is also calculated by applying the free supply to f.o.b. unit values (Table 7). These too have been considerable, averaging Le. 1.6 million per year at current prices.

TABLE 6.—ESTIMATION OF NET PRODUCER LOSS AND RATE OF "DISRETURN" ON PALM KERNELS AFTER SUBTRACTING THE AREA UNDER THE SUPPLY CURVE, SIERRA LEONE, 1950-72\*

Year	Net producer loss (1961 leones)	Rate of "disreturn" (percent)
1950	757,494	23.8
1951	1,083,025	24.8
1952	497,877	18.4
1953	231,198	10.8
1954	86,030	7.8
1955	35,436	5.9
1956	43,246	6.5
1957	24,410	5.3
1958	92,953	12.3
1959	551,297	25.4
1960	217,158	15.3
1961	...	...
1962	...	...
1963	55,348	6.8
1964	88,379	10.3
1965	309,803	20.4
1966	220,882	18.9
1967	<sup>a</sup>	...
1968	1,195,715	36.6
1969	74,165	9.4
1970	245,857	15.7
1971	173,585	10.5
1972	<sup>a</sup>	...

\* Net producer loss =  $327 \times [(\text{Deflated surplus and duty})/(\text{Tons exported})^2]$ . Three hundred and twenty-seven is one-half the regression coefficient of equation (2), Table 3. (See text for further description.) Rate of disreturn = net producer loss as a percent of surplus and duty.

<sup>a</sup> Gain.

TABLE 7.—ESTIMATION OF EXPORT LOSS (AT CURRENT PRICES) FROM PALM KERNELS TAXATION, SIERRA LEONE, 1950-72\*

Year	F.O.B. unit value (leones per ton)	"Free" supply (tons)	"Free" export value	Actual export value	Export loss (million leones)
1950	63.92	104,890	6,704,569	4,555,504	2.2
1951	121.16	112,078	13,579,370	9,099,554	4.5
1952	122.45	97,455	11,933,365	9,351,828	2.6
1953	123.64	89,260	11,036,106	8,519,078	2.5
1954	110.57	79,673	8,809,444	7,527,848	1.3
1955	87.08	67,554	5,882,602	5,019,074	.9
1956	87.01	66,305	5,769,198	5,015,778	.8
1957	85.08	61,099	5,198,303	4,506,714	.7
1958	89.66	67,966	6,093,832	4,896,512	1.2
1959	110.40	85,886	9,481,814	6,351,242	3.1
1960	106.99	76,546	8,189,657	5,833,606	2.4
1961	84.40	...	...	4,875,244	...
1962	80.43	57,946	4,660,947	4,904,904	-2
1963	92.95	60,628	5,635,373	4,906,618	.7
1964	93.39	62,394	5,826,976	4,871,000	1.0
1965	113.90	70,242	8,000,564	5,581,000	2.4
1966	92.78	67,855	6,295,587	5,103,000	1.2
1967	99.91	24,575	2,455,288	1,099,000	1.4
1968	134.27	88,188	11,841,003	8,593,000	3.2
1969	109.97	58,306	6,411,911	5,389,000	1.0
1970	118.69	64,153	7,614,320	7,003,000	.6
1971	115.98	61,988	7,189,368	5,915,000	1.3
1972	75.61	45,656	3,452,050	3,856,000	-4

\* Based on preceding tables (see text). Total export loss, 1950-72 (excluding 1961) = Le. 34.4 million (current prices). Average = Le. 1.6 million per year.

A similar exercise was carried out on the cocoa statistics, but this was much more tentative because of the lesser precision of the supply functions. In addition, there is probably a greater degree of substitution among cash crops by cocoa and coffee growers than by palm kernel suppliers. Nevertheless, and despite biasing the calculation towards conservatism, rates of disreturn of similar magnitude to those for palm kernels were indicated, while export losses were of the order of Le. 1 million per year at current prices. In recent years, too, the taxation of cocoa and coffee has been greater than that of palm kernels, reflecting their improving world markets relative to that for kernels.

What did the Marketing Board do with its surpluses? Until the mid-1960s, the Board's funds were channelled in two principal directions: firstly, funds were handed over to Government for "development purposes" and secondly, what was left was largely invested in British Government Securities. It is true that a certain amount of money went back into agriculture in the form of palm oil mills, established in the early 1950s, but these consistently lost money to the tune of around Le. 100,000 per year.<sup>11</sup>

In 1964, things took a different turn when the Board's funds began to be

<sup>11</sup> See M. G. Fenn (*I2*, p. 31) and Sierra Leone Produce Marketing Board, Annual Reports, 1949-63.

spent on extremely ill-considered projects, including a palm kernel oil mill costing Le. 1.7 million which opened in 1967 and closed in 1968 after heavy losses,<sup>12</sup> an instant coffee factory, purchased but never built (Le. 0.7 million) and various others (45) together with half a million acres of plantations. The total amount spent has been put at over Le. 10 million, (12, p. 13) and by the end of 1966, as all the projects were losing money, the Board did not have sufficient funds to pay for the produce on offer so that it was obliged to borrow Le. 4 million. The devaluation of the Leone with the pound sterling in 1967, the Nigerian war, and a typhoon in the Philippines in 1968 came to the rescue by raising palm kernel prices; and the Board was able to pay off its debts in that year and return to normal. Thus, after squandering its surpluses, getting itself into debt, and the country into balance of payments difficulties, the Marketing Board and the Government proceeded to tax agriculture even further in 1968 to get out of troubles of their own making.

### *Food Production*

The agricultural sector of Sierra Leone is dominated by rice production, two-thirds of which comes from shifting cultivation and the remainder from various kinds of permanent swamp cultivation.

Shifting cultivation of rain-fed rice is made possible in this part of Africa by the existence of a very pronounced wet season, lasting roughly from April to October. Bush is lopped and felled during the dry season and then burned. Sowing takes place after the first slight rainfall of the year when the ground is soft for working. Correct timing of the burn and the sowing operation are of absolutely vital importance in obtaining a reasonable crop, and for that reason many farmers try to get their sowing done within a day. For this they need a large body of workers: the men hoe the soil in a line, followed by the sowers and then a line of women who hoe in the seed. The best burn is obtained with cut wood that has been left longest in dry weather—early rain can be disastrous. Equally, if rain does not fall again for a long time after sowing, the crop is in danger of failing. Weeding and pest-scaring take place during the wet season and the rice is harvested, along with intercrops, at the beginning of the next dry season. The bush may then be left to regenerate for some years, or this may be preceded by another year or two's cultivation of groundnuts, cassava, or the like, possibly not covering the entire area that had been sown to rice.

The fertility of land that is left fallow under shifting cultivation probably increases at a diminishing rate (35), so we cannot really say how long it takes for fertility to be fully restored, as such a state may be approached asymptotically. "Recommended" or "satisfactory" lengths of fallow period vary, but are generally of the order of 10 to 20 years. Plainly, with a fixed supply of land and growing population, fallow periods and soil fertility must decline, and in some parts of the country it is evident that this process has become far advanced. What tends to happen as fallow periods shorten, is that farmers change from upland cultivation to permanent swamp cultivation, which requires some considerable investment of effort in land clearance, bunding, stump removal, leveling, and so on.

<sup>12</sup> It has recently been rehabilitated with the help of an International Bank for Reconstruction and Development (IBRD) loan.

This process is very much in line with E. Boserup's ideas (4), and its existence is attested by a strong correlation for the twelve Districts of Sierra Leone between the proportion of rice acreage as swamp and the proportion of bush that is very young when cleared (less than three years old) (29).

It is doubtful whether the change to swamp cultivation is sufficient to keep food production in line with population, however. The United States Department of Agriculture (USDA) estimates that per capita food production and per capita rice production have declined in the last decade (47), and this is supported by the rise in the index of food prices, which is in fact quite well correlated (negatively) with the USDA estimates of per capita food production in Sierra Leone (27, pp. 323-24).

Rice imports are controlled by government through the Rice Corporation, but nevertheless seem to be roughly determined by the domestic supply situation. The import figures shown in Table 8 appear to be negatively correlated (if weakly) with the USDA production figures. The general policy of the corporation is to order rice from overseas in September or October on making an assessment of the forthcoming harvest. There may be delays in importing until the next calendar year. Imports have only been significant since the early 1950s

TABLE 8.—RICE STATISTICS, SIERRA LEONE, 1954-72\*  
(Thousand metric tons husk, or husk equivalent, except as otherwise indicated)

Year	Rice production	Rice imports	Value of imports (million leones)	Import unit value (leones per ton)	Purchases of domestic rice	Purchase price of rice (leones per ton)
1954	287	7	.6	83	...	...
1955	282	32	1.9	61	5.7	78
1956	282	56	3.3	59	8.3	78
1957	292	47	2.9	61	9.9	75
1958	321	32	2.1	64	11.5	75
1959	335	63	4.0	63	9.2	71
1960	368	42	2.5	59	21.4	67
1961	386	6	.4	70	18.7	63
1962	404	41	2.7	66	11.0	60
1963	418	32	1.9	59	19.4	60
1964	421	1	.1	94	9.7	60
1965	400	28	1.8	65	4.8	75
1966	390	57	3.4	61	1.6	75
1967	400	33	2.4	72	4.4	75
1968	433	17	...	...	3.4	75
1969	407	14 <sup>a</sup>	1.1 <sup>a</sup>	76	4.9	75
1970	425	66	5.0	76	...	...
1971	443	83	4.9	59	...	...
1972	447	8	.5	63	...	...

\* Production data from U.S. Dept. Agr., Economic Research Service, *Indices of Agricultural Production in Africa and the Near East*, 1963-72, p. 32; ERS Foreign, Rev., May 1973, and earlier issues; and personal communication from USDA. Imports from Sierra Leone, Central Statistics Office, *Annual Trade Reports, Quarterly Statistical Bulletin*; and from *Sierra Leone Trade Journal*. Purchases and prices and supplementary import data from M. G. Fenn, "The Marketing of Farm Crops in Sierra Leone" (12). Purchases by the Rice Department at guaranteed prices to the nearest leone up to 1964, thereafter by the Rice Corporation.

<sup>a</sup> Approximate.



(before which small amounts of rice were exported), and it is often argued—*post hoc, propter hoc*—that they arose as a result of the migration of labor to the diamond fields when the Government made legal the private, small-scale digging of diamonds (i.e., in addition to capital-intensive mining by the former Sierra Leone Selection Trust, which had had a statutory monopoly until that time). It is not clear whether the effect of this is thought to be more a result of the rise in demand owing to high mining incomes or a drop in supply as a result of labor migration. That it was predominantly the effect of either is at least questionable.<sup>13</sup> The overall income elasticity of demand for rice, in Freetown at least, has been estimated at about zero (28), (and data on rice consumption by income level for the provincial urban areas also strongly suggest a very low elasticity [43, Table 7, 44, Table 7]), while much of the mining labor comes from localities close to the mines (27), and it has been suggested that many men go back to the land to help with burning and planting.<sup>14</sup> Also the steady postwar urban growth and migration from the land may have had some effect on supply, although the evidence seems to show that migrants have tended to come more from areas where their productivity was low in any case (27). Certainly in Nigeria, G. Okurume (36) found that the demand for imported food is largely explained by urban income. At least some of the blame for the continuing imports of rice may lie with the government's own policy of pegging the price of rice. Government intervention, after the war, began in 1952 when the Rice Department established minimum producer prices and purchased domestic rice at those prices in order to ensure adequate supplies. These prices generated deliveries to the Department that in the end far exceeded its milling capacity (which was not in fact very great) and after 1960 prices were gradually cut (see Table 8). Despite the Rice Department's policy during the 1950s, however, imports, which were controlled by the Department, were still very large (Table 8).<sup>15</sup>

The effect of the cut in prices was of course to reduce substantially the amount of rice offered to the Department and later the Rice Corporation which replaced it, although this appears to have also been a result of the decline in domestic production. Indeed a large proportion of the Corporation's purchases come from producers' co-operatives that are under pressure to "support the Rice Corporation" (12, p. 47). Given this situation and the fact that the Corporation is the only importer, it is fairly obvious that the pricing policy is now firmly consumer-oriented, and largely Freetown consumer-oriented at that, since it is more difficult to police elsewhere in the country; indeed the way in which imported rice is marketed cannot allow any effective policing of low prices in up-country areas. It is simply sold at the official wholesale price to agents who are told the official margin that is supposed to dictate the official retail price. Just how ineffective the arrangement is can be seen from Table 9.<sup>16</sup> Probably a fair proportion of rice

<sup>13</sup> W. O. Jones opts for the income effect (see 23).

<sup>14</sup> J. I. Clarke states that "mining necessarily declines just before the end of the dry season as many men return to their home villages and towns to farm" (5).

<sup>15</sup> One phenomenon that makes one question the idea that it was the movement of labor to diamond-digging that was entirely responsible for the continuing rice imports, is the fact that these imports have fluctuated considerably since they became centrally controlled, whereas before that the foreign balance in rice was very stable.

<sup>16</sup> M. G. Fenn (12) remarks that these margins are probably understated because of the loss in weight between wholesaling and retailing (*op. cit.*, p. 45).

TABLE 9.—OFFICIAL WHOLESALE RICE PRICES AND OFFICIAL AND ACTUAL RETAILING MARGINS, 1966\*

Town	1966 Official wholesale price ( <i>leones per 160 lbs.</i> )	Gross retail margins at	
		Official prices ( <i>percent</i> )	Observed prices ( <i>percent</i> )
Freetown	8.00	7.5	12.5
Bo	8.50	7.0	23.5
Kenema	8.65	6.9	38.7
Pujehun	8.90	6.7	30.4

\* Data from I. I. May-Parker, "The Marketing of Rice in Sierra Leone" (unpub. B.Litt. diss., Glasgow University, 1967).

imports are consumed in the Freetown area. Total consumption there in 1967 is estimated from a household survey (42) at roughly 20,000 tons of milled rice. Imports in that year were about 24,000 tons, while the Rice Corporation's purchases of local rice were about 3,000 tons milled equivalent (Table 8). A study of marketing in Sierra Leone revealed that 85 percent of rice wholesalers in Freetown said the Rice Corporation was their most important source of supply, while 77 percent of the Freetown retailers took supplies from Freetown wholesalers (33). Thus a high proportion of the 20,000 tons came from the Corporation while most of the Corporation's supplies were imports.

The net result of the double policy of allowing, but restricting, relatively cheap rice imports and weakly controlling the price of rice is thus to subsidize consumers in the capital city at the expense of those in the rest of the country, owing to black-market effects. Total removal of restrictions on imports would remove this, but would hit the domestic marketed surplus<sup>17</sup> and the balance of payments, which would seem to indicate some overvaluation of the exchange rate, and which is depriving domestic producers of income from marketed surplus. Whatever interpretation we choose, it is plain that Freetonians are privileged in being able to buy rice more cheaply than anyone else can.

Government policy towards rice has been dominated by the desire to cut down imports, despite the fact that it controls those imports itself and keeps the metropolitan price and the official producer price low, and despite the fact that losses of export earnings as a result of its own taxation of agriculture have been of the same order of magnitude as the spending on imported rice. There is no mention of any other objective in the following extract from a speech by the Governor of the Central Bank:

Of particular interest is the fact that the Ministry of Agriculture and Natural Resources have been stepping up their efforts to increase the consciousness of farmers of the need to expand rice production through mechanical cultivation and more intensive cultivation of inland swamps. This is indeed a welcome step in finding a solution to the problem of

<sup>17</sup> This is not very great, being about 30 percent of total marketed rice including imports, and worth about Le. 1.5 million in 1966 (41). Imports in 1966 were, however, higher than usual (Table 8), and presumably the surplus was lower for the same reason, that is, a poor harvest.

acquiring self-sufficiency in rice. To date, valuable foreign-exchange which the country can ill afford has been expended on the importation of rice.<sup>18</sup>

Given the goal of self-sufficiency, let us see how effective these two approaches—mechanical cultivation and encouragement of inland swamp cultivation—might be and what other consequences they might have.

J. M. Due and G. L. Karr (10) have recently examined the economic implications of several alternative policies for increasing rice self-sufficiency, including the two mentioned. They estimate the foreign exchange costs of fertilizers, machines, and so on, arising from the schemes, the extra labor required (“employment generated”), and the extra farm income, assuming a need to increase production by 29,000 tons so as to become self-sufficient and with no allowance for increasing commercial demand or autoconsumption; or alternatively, by 94,000 tons by 1974/75 allowing for these increases. They reach the following conclusion (10, p. 64):

If the objectives are for Sierra Leone to become self-sufficient in rice production by 1974/75 and do this by conserving foreign exchange and additional acres required, by maximizing employment and income generated in the agricultural sector, and by minimizing annual domestic Government outlay, development of inland-valley swamps under present technology would receive highest priority.

However, where they refer to “employment generated” they in fact mean labor requirements, and it turns out that these are considerable. The flaw in the argument lies in their not taking into account the opportunity cost of using that labor, in terms of foregone upland rice production (not to mention the inducement required for people to change from upland to swamp), which is probably also considerable. The extra manpower required (for 94,000 extra tons) is about 50,000 head, which, assuming 250 man-days per head, is equivalent to 12.5 million man-days. Upland labor input has been estimated at about 100 man-days per acre, (24) and yields at about 1,000 pounds per acre (41). Thus the drop in upland production would be 125 million pounds or roughly 56,000 tons. The aim of 94,000 extra tons would therefore not be achieved.

All except one of the several schemes Due and Karr consider involve extra labor of the same order of magnitude and so are uneconomic for the same reason. The single exception is the improvement of ordinary upland yields using fertilizer, which requires extra labor amounting to only 3,000 odd head to get another 94,000 tons. Moreover, the foreign exchange and other costs do not seem excessive.

However, another possibility emerges from closer consideration of the current policy of subsidizing the clearance of inland swamps for cultivation. This policy, which as we have seen, Due and Karr mistakenly support, is directed mainly at the eastern parts of the country, which are particularly well-endowed with swamps. The subsidy is currently Le. 30 per acre cleared, leveled, banded, and planted according to instruction (25). A recent study comparing returns

<sup>18</sup> S. L. Bangura, at the Governor's Banquet, Bank of Sierra Leone, Freetown, January 29, 1971, *Bank of Sierra Leone Economic Review*. Press reports at the time of writing indicate that contracts to import over 63,000 tons of clean rice in 1974 have been placed, at a crippling cost of Le. 23 million.

from inland-swamp cultivation and upland cultivation allows estimates of productivities at 19 pounds and 10 pounds of rice per workday respectively (not counting the investment labor required to establish a swamp in cultivation, which is the object of the subsidy) (24). However, these calculations may depend rather crucially on yields, which are assumed to be 2,400 pounds per swamp acre and 900 pounds per upland acre. In the Eastern Province, where the scheme is concentrated, fallow periods are relatively long, so that yields are probably high.<sup>19</sup> Also, given that intercrops, which are often very significant, especially where fallow periods are long, are not allowed for in the above calculations, and that there is a preference for upland rice over swamp rice, the true difference in productivities may not be so great. Quite apart from that, the subsidy has to be paid and the loss of upland production must be allowed for in transferring to swamps. Where fallow periods are low, swamps are cultivated anyway, without a subsidy. Thus it would be far less costly, more equitable, and more likely to succeed, if the Government were to encourage swamp cultivation in the areas where it is already taking place, i.e., where fallow periods are short and people are feeling the pinch of population pressure. There is evidence too that these are the areas generating relatively high rates of rural emigration (27)—presumably also an indication of relatively great poverty. Consequently, Government investment in these areas might well, through the stemming of migration, inhibit the growth of urban unemployment which has also been of some concern in recent years.

#### CONCLUSIONS

In summary, economic management in Sierra Leone can be criticized on the following grounds:

1. Taxation of agricultural exports through the Marketing Board and export duties has been heavy relative to producers' income from these commodities.
2. Direct spending by the Marketing Board out of the funds it has accumulated has generally been wasteful and most of it can be written off as a loss.
3. Spending by Government on agriculture has been a small proportion of total Government spending and has on average been lower than revenue from agriculture, implying a net flow of resources out of the sector.
4. The taxation of exports has inhibited supplies to such an extent that estimated producers' income losses are much greater than the revenue obtained, as also are the foreign exchange losses (which are understated if the currency has been overvalued). The rate of "disreturn" on the disinvestment in (taxation of) agriculture has been high. Much higher rates of return are necessary in other sectors to justify the transfer of resources from agriculture. (In fact the projects set up by spending Marketing Board funds generally yielded negative rates of return).
5. Government's policy towards agriculture is dominated by a desire to save foreign exchange spent on imports of rice, despite the fact that its own taxation of agricultural exports has resulted in losses of foreign exchange of the same order as the amount spent on rice.

<sup>19</sup> The Agricultural Survey (41) gives upland yields in the Eastern Province of about 1,200 pounds per acre, compared with the average of 1,000 pounds.

6. Present policies on rice production are unlikely even to achieve the import-saving goal, let alone income and equality goals.
7. Cheap rice imports have been allowed into the country, but restricted, while retail prices have been kept low but without effective policing except in the capital city. Black market effects have raised prices elsewhere, making Free-town consumers privileged.

It has obviously not been realized how damaging the taxation of agricultural exports has been. This is doubly unfortunate in the particular case of Sierra Leone because this source of taxation is relatively unimportant in terms of its contribution to total revenue, especially as compared with a country like Ghana. But while it would seem advisable to abolish completely any taxation of palm kernels, it is not clear that this would be worthwhile now in regard to cocoa and coffee for which the markets tend to be disciplined by international agreements.

As in Asia and Latin America, the distortion of prices—of rice, of export crops, possibly of foreign exchange, and of labor through the usual urban-manufacturing bias of African economic policy—has resulted in an economic performance probably far inferior to what might have been achieved. As in most of Africa, only the select few have benefited.

#### *The Wider Implications*

*Exports.*—Sierra Leone, with a small market share for all its major export crops, is in the special position of being a price-taker. Of course, the results on income and export earnings loss would not apply to a Nigeria or a Ghana, as those countries account for sizeable market shares and hence face significantly downward sloping demand curves for their exports. Inhibition of supply by export taxation might therefore actually result in a gain to producers, at least in the short run. On the other hand, such policy keeps world prices higher than they otherwise would have been, a situation which is, of course, quickly taken advantage of by competing countries. Restriction of coffee supply by Brazil for short-term gain probably goes some way in explaining the long-term decline in her market share. Could it be that export taxation on the part of Anglophone African countries can similarly be blamed for the rise to prominence of the Francophone African countries, and especially the Ivory Coast? The immediate response to such a suggestion is that the French-speaking countries have taxed their agricultural exports in much the same way as have Ghana, Uganda, and Nigeria, both through direct government taxation and even through their own “marketing boards” (Caisses de Stabilisation des Prix), although the latter have not accumulated surpluses to the same extent as the Anglophone countries. But there is a significant difference. Until 1964, when Yaoundé Convention rules began to be phased in, France offered prices higher than world prices to the Francophone countries, and especially for coffee, groundnuts and bananas. The financial advantage to the African countries has been considerable; for instance, it has been estimated that for the period 1960–66, the effective subsidy of Ivory Coast exports by France (the difference between the French and world prices multiplied by the volumes exported) was about \$100 million (22),<sup>20</sup> and that going to a country whose popu-

<sup>20</sup> In reality, this should be much greater, if we take into account the supply effects of higher prices.

lation was less than 4 million. Apart from French price support there were other sources of trading advantage in favor of the Francophone countries; for example, although there was no support for cocoa prices, there was an intervention price and loans were made available to the Stabilization Funds to moderate the effects of price fluctuations. The Yaoundé Convention also made provisions for loans to the Funds and for direct aid to increase productivity. Another way of arranging to have high producer prices while not losing on government revenue is suggested by R. Dumont (who disapproves of the Francophone arrangements and approves of marketing board surpluses, (11, p. 179):

In the summer of 1961 the peasant in Souanke received 85 CFA francs for a kilogram of cocoa, which came to 104 francs delivered to Pointe-Noire. The world price there would have been 66 francs. The Congolese budget paid the difference, but because of it had an increased deficit, was unable to make investments, and "held out its hand" for foreign aid to balance the budget, instead of "rolling up its sleeves."

The gain from this kind of special treatment by France, and later the European Economic Community (EEC), did not of course accrue directly to export-crop cultivators but to the Funds, which were thus able to accumulate surpluses and export duties while paying producers' prices that were, in general, much closer (or even above) the prices they would have received in a free market situation. The Funds and governments accumulated surpluses and taxes, therefore, through European subsidies much more than by effective taxation of indigenous cultivators,<sup>21</sup> in complete contrast to the situation in the Anglophone countries. We have seen what these arrangements can mean in terms of economic effects: the French-speaking countries have not inflicted economic losses upon themselves through interventionist policy to anything like the extent that the English-speaking countries have; moreover, the Anglophone loss is a Francophone gain, for it involves a unilateral supply restriction and keeps up world prices for the benefit of others.

Taxation of exports would have the biggest growth impact when the crops involved were tree crops. With annual crops (e.g., groundnuts, palm kernels, etc.), manipulation of the producer price upward or downward would merely affect current producer incomes. There would presumably be little effect on capital formation, as the dominant inputs are land and labor, although it could be that investment in land improvement might be affected and thus affect productive capacity and future output flows. There are only scraps of evidence on this; for instance, it is said that in the past there has been some thickening up of "wild" palm groves and efforts to clear surrounding vegetation in Sierra Leone during periods of high palm kernel prices. Manipulation of tree-crop producer prices, on the other hand, would markedly influence the amount of capital formation in the form of tree-planting and therefore future income flows. We have seen how great an economic effect there is on an annual crop: it would seem not unreasonable to deduce that the impact on planted tree crops is much greater. Interventionist price policy in tropical Africa probably had the largest effect in the

<sup>21</sup> In Togo, for example, an economy rather similar to that of Sierra Leone, Caisse de Stabilisation des Prix (CSP) surpluses during the early sixties were about the same order of magnitude as the financial advantage from French support (46).

Ivory Coast since coffee dominates her exports and it is coffee, being a tree crop, that has benefited most in terms of *growth*, from French and European protection. Also it must be the East African countries, especially Uganda, that have suffered most from coffee taxation—at the same time keeping world prices up, for others to benefit, by inhibiting their supplies. Perhaps, too, the fact that Senegal's major export, peanuts, is an annual crop, explains why that country has not fared so well as the Ivory Coast, despite French protection to the same degree (i.e., calculated by multiplying the difference between French and world prices by quantities exported to France).

*Food*—It might be felt that the conclusions regarding the food sector are not of very general applicability, especially as rice is not widely grown in western Africa and is not commonly a major staple. But there is a certain common trait about food production in Africa that may apply whatever particular crop we are referring to. We have seen that rice production tends to become more intensive, the greater the pressure of population on resources, mainly by converting to permanent, irrigated swamp cultivation from the shifting, rain-fed system. Although the type of intensification that occurs varies according to crop and physical conditions, this tendency has been noted throughout West Africa at least,<sup>22</sup> and more generally (4).

One of the lessons we can perhaps derive from Sierra Leone, is the one that developers have been slow to learn, namely, that the farmers themselves have much to teach the developers. They already and all the time are engaged in their own capital formation and they have an accurate knowledge of the real costs, real returns, and risks involved: "By and large it has been the individual farmers working within a gradually changing traditional environment who have accounted for most of whatever progress has been achieved" (7, Vol. 1, p. 221). And yet our knowledge of these processes is not great. Agricultural economists who have made studies of African village economies have on the whole continued to make their inquiries static. A notable exception is Margaret Haswell, (16, 17) who shows how farming systems in Gambia adapted to changing external conditions. Also, D. E. Welsch (49) shows how new systems of rotation are adopted as land becomes increasingly scarce. These and the above evidence from Sierra Leone give the impression that adaptive change is sluggish and usually insufficient or only just sufficient to maintain standards of living. Perhaps this inertia arises because it is often necessary that the social structure be changed in line with the economic. For instance, the economic alterations noted by Miss Haswell entailed a breaking down of the customary separation of male and female farming tasks, while a move from bush-fallow systems to permanent cultivation tends to involve a modification of land tenure arrangements. Thus there are social factors strongly inhibiting change, as well as risk and perhaps the sheer effort required for things like land clearance. These work against already existing potential for agricultural development, but they should be relatively cheap and easy for outside agencies to overcome, particularly where there is just a question of "tipping the balance" towards change. Conversely, experience in Sierra Leone suggests that the more the dynamics of African agriculture are ignored

<sup>22</sup> See 14. Examples of forms of intensification besides swamp rice cultivation are: use of compost and manure, mixed farming, crop rotation, and terracing.

and the more distorting are the attempted "development" changes, the greater is the economic cost of making those changes. This is not, of course, to say that we should ignore new technology, but that there should be a courtship of appropriate length and intensity before the new and the indigenous are married.

## POSTSCRIPT

It would be unfair not to add that in the recently published *National Development Plan* (August 1974) it is the Government's declared intention to place much greater emphasis on agriculture than in the past. A significantly greater proportion of government spending will go for agriculture, and higher producer prices for rice and for export crops are planned.

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