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ANNEX D - Agriculture Sector Assessment and Supplement on Role of Women in Ghanaian Agriculture

# G H A N A AGRICULTURAL SECTOR ASSESSMENT

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# CHAPTER I - INTRODUCTION

# I. INTRODUCTION

## A. Objectives of the Agricultural Assessment

### 1. The DAP

The Development Assistance Program (DAP) is AID's principal planning and programming document. The purpose of the document is to define the host countries development priorities and in line with Agency priorities develop an appropriate plan of U.S. assistance.

The DAP is intended to be focused on priority sectors and constraints rather than on aggregate development issues and contain two basic parts:

a) A Summary narrative statement discussing the country's development situation and a rationale for U. S. assistance, and

b) Sector analysis/assessments for each sector in which U.S. assistance is contemplated.[1/]

### 2. The Agricultural Sector Assessment

Since the agricultural sector is the dominant sector in the Ghanaian economy and it is believed that domestic food production is not keeping pace with demand it was determined that a sector assessment should be undertaken for agriculture. It was presumed that agriculture would be a major area of U.S. assistance in Ghana and therefore an assessment should be prepared as part of the process of preparing a

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1/ Drawn from a Memorandum prepared by Mr.A.Gayoso for the Agency DAP Review Committee.

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Development Assistance Program for Ghana.

An "Assessment" as opposed to an "Analysis" was determined to be the appropriate approach for agriculture, because of the quantity and quality of the data available on Ghanaian agriculture and owing to a critical man-months constraint for the preparation of sector document.

The purpose of this Agricultural Assessment is the following:

a) To identify and to the extent possible quantify the internal structure of the sector.

b) To determine to the extent possible, the inter-relationships among components of the sector and between agriculture and the rest of the economy.

c) To describe the sectoral resource base, the nature and variation of on-farm resources, and the level of agricultural technology in current use.

d) To describe current policy directions, priorities and incentives to increase agricultural production.

e) To identify constraints which impede agricultural progress and the achievement of policy objectives.

f) To identify means of overcoming farm and sectoral constraints.

B. Scope and Approach.

The Sector Assessment was prepared largely from Government of Ghana publications and published and unpublished reports of various other organisations including the University of Ghana, ISSER, USAID, IBRD and FAO. During the preparation of the report a limited number

of interviews were held with Government officials mostly within the Ministry of Agriculture. Unfortunately the Director of Agriculture was out of the country during the preparation of the Assessment.

The report was prepared at the USAID Mission in Accra over a-four-week period beginning the second week of November. About 3-man-months were involved in the preparation of this draft report.

The Agricultural Assessment is extensive and covers the major components of the Sector. The Smallholder was the major focus throughout the preparation. Given the time available to the Team, the approach was largely discipline. Areas for more detailed future work and analysis have been identified in the body of the report.

# CHAPTER II - ROLE OF AGRICULTURE IN THE GHANAIAN ECONOMY

## II. ROLE OF AGRICULTURE IN THE GHANAIAN ECONOMY

### A. Historical Perspective.

Today, the agricultural sector consists of about 53 percent of a total population of about 9.2 million people. In 1970 it was estimated that the population was 8.5 million out of which the farm population was 1.6 million and the urban population was 2.4 million.

Historically, cocoa has been the major product and foreign exchange earner for Ghana. Production and exports of cocoa expanded at the turn of this century and have been the basis of growth ever since. The crop was adopted by small holders in the forest zone where it was adapted to the ecology and proved to be profitable. During the decade of the 1960s about 20 percent of the total labor force was engaged in cocoa production either as farm operators or hired laborers.

Despite the dependence on cocoa as the major foreign exchange earner, there is a substantial diversity in crop production, farm size and degree of market orientation within Ghanaian agriculture. However, to generalize, the common farmer operates about 5 acres of land and has adapted his production practices to a relative abundance of land and labor, meager capital resources and to soils which become rapidly exhausted if farmed intensively.

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There is, however, an increasing category of farmers who produce 1 or 2 cash crops on relatively large acreages and who have adopted production systems which use increasing quantities of capital and, on a per acre basis, relatively low labor inputs. Capital inputs on these farms are largely in the form of tractor mechanization (owned or hired) and to a lesser degree improved seed and inorganic fertilizer.

Up to the late 1950s domestic food production kept pace with expanding effective demand. Effective demand was expanding due to population growth and increasing purchasing power, the latter largely due to the urban construction boom of the mid and late 1950s. On the supply side, increased food production was achieved mainly by way of acreage expansion. However, since about 1958 domestic production has been augmented with increasing quantities of imported food.

To stem increasing foreign exchange requirements for food imports and rising food prices there was an attempt in the 1960s to expand domestic food production by way of government tractor-hire services and public production units (e.g. State Farms Corporation). The approach required large amounts of domestic capital and foreign exchange but contributed little to domestic food production. The drastic failure of this approach is well known.

During the 1960s Ghana experienced a massive reduction in foreign exchange reserves and a balance of payments crisis. This led to import controls and one of the manifestations was the inability of farmers to obtain essential imported inputs (e.g. cutlasses, hoes and

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insecticides required for spraying cocoa). The agricultural policies of this period did not lead to large increases in food production from large-scale, capital intensive production units as expected and at the same time thwarted increased food production in the small-scale private sector since farmers did not have the hand tools to fully utilize existing land and labor resources.

Between 1968 and 1972 import controls were liberalized, food imports further increased, world cocoa prices declined, domestic food prices increased and Ghana's debt burden swelled. In short, the country was living beyond its means. In December 1971, the government in desperation devalued the domestic currency by a massive 42 percent. The purpose and effect was to increase the domestic price of imported goods, a policy move in the right direction, but the magnitude in a single action was unrealistic.

On January 13, 1972 a military coup d'etat took place and the National Redemption Council (NRC) as its first policy action revalued the currency by 10 percent and imposed a strict system of import licensing. Furthermore, "essential imported commodities" were subsidized thus further reducing the retail prices of these goods (e.g. tinned milk, sardines, sugar and cutlasses). As its second major policy action, the NRC placed agricultural development as the number one priority of the new government.

B. Rural Population and Employment.

The distribution of the rural population in Ghana is given below in Table 1 for the 1960 and 1970 Census years.

TABLE 1 REGIONAL DISTRIBUTION OF THE RURAL POPULATION, (000's)

| Region | 1960 | 1970 | Rural Population as a Proportion to Total (%) 1960 | 1970 | Annual % Compounded Rate of Growth |
|---|---|---|---|---|---|
| Western | 476.3 | 565.2 | 76 | 74 | 1.73 |
| Central | 547.8 | 645.2 | 73 | 72 | 1.65 |
| Eastern | 879.6 | 946.0 | 80 | 75 | .73 |
| Volta | 674.0 | 792.8 | 87 | 84 | 1.64 |
| Ashanti | 827.4 | 1081.8 | 75 | 73 | 2.72 |
| B/Ahafo | 502.7 | 598.3 | 86 | 78 | 1.76 |
| Northern | 462.5 | 580.0 | 87 | 80 | 2.29 |
| Upper | 724.8 | 795.1 | 96 | 93 | .93 |
| G/Accra | 98.4 | 99.4 | 20 | 12 | .10 |
| Total .. | 5193.5 | 6103.8 | 77 | 71 | 1.63 |

Source: Population Census 1960 and 1970

The rate of growth of the total population was estimated at 2.42 % per year over the decade. (As will be explained later, the Census grossly under-estimated the "true" rate of population increase). The urban population grew at 4.76 %/year. Only the Ashanti Region, Ghana's richest agricultural region, was the rural population growth rate higher than the total population growth rate. This implies a

significant drift of the rural population to urban centers (defined as 5,000 persons or above) during the decade. The growth of urban centers in Ghana is not confined to Accra. Annual rates of growth of the urban population for some regions is as follows:

| | | |
|---|---|---|
| Northern Region | - | 7.96%/year |
| Brong/Ahafo | - | 6.79%/year |
| Upper Region | - | 6.66%/year |
| Greater Accra | - | 6.66%/year |
| Volta Region | - | 4.10%/year |

Source: Population Census, 1970. (Rates of urban population growth for other regions were between 3.08% and 3.98%/year.)

Other than Greater Accra and parts of Brong/Ahafo these regions are the least developed regions in Ghana. It is likely that migrants in the new urban centers of these regions will, if appropriate policies are not implemented, eventually migrate further to the richer urban centers in southern Ghana.

The greatest declines in the rural population relative to the total population were recorded for the Brong/Ahafo, Greater Accra, Northern and Eastern Regions over the decade. These areas have been experiencing considerable transition. For the Brong/Ahafo, the Northern and Eastern Regions, the transition may be explained by partial agricultural transformation or commercialization; for the Greater Accra area industrialization and urbanisation certainly have been important ex-

planatory factors.

Over the 1960-70 period the total work force (15 and over) has increased by 2 percent per year. The increase in the total number employed in all industries was 2.04 percent per year (Population Census data). The increase in the number employed in agriculture was 1.2 percent per year over the decade and the increase in the number employed in the non-agricultural sector was estimated at 3.2 percent per year.

The proportion of the number employed in agriculture to the rural population decreased slightly over the decade, from 32 percent in 1960 to 30 percent in 1970. The decrease in the proportion of the number employed in non-agriculture to the urban population was greater; from 63.8 percent in 1960 to 55 percent in 1970. The decrease in the relative number of persons employed in urban areas explained a major part of the decreases in the total number employed in all industries in relation to the total population; the latter decrease was from 38.0 in 1960 to 36.7 percent in 1970. These facts suggest that rural areas released emigrants at higher rates than urban areas could absorb in employment during the 1960-70 period.

Table 2 shows the distribution of the agricultural work force by region and by sex for 1960 and 1970.

The agricultural work force increased at a rate less than the increase of the population aged 15 and over during 1960-70. The increase in the female agricultural work force was 2.4%/year, far greater than the increase in the male agricultural work force (1.5% /year and sligh tly

TABLE 2 REGIONAL DISTRIBUTION OF AGRICULTURAL WORK FORCE AND VALUE OF AGRICULTURAL PRODUCTION PER WORKER

| Region | Total Agricultural work force (000's) 1960 | 1970 | Male 1960 | 1970 | Female 1960 | 1970 | Value of Agricultural Production per Worker (Cedis) 1970/71 |
|---|---|---|---|---|---|---|---|
| Western | 127 | 159 | 66 | 75 | 61 | 84 | 270 |
| Central | 171 | 202 | 78 | 83 | 93 | 119 | 197 |
| Eastern | 266 | 282 | 159 | 149 | 107 | 133 | 279 |
| Volta | 181 | 206 | 103 | 103 | 78 | 103 | 246 |
| Ashanti | 268 | 310 | 141 | 145 | 127 | 165 | 432 |
| Brong/Ahafo | 170 | 230 | 113 | 185 | 57 | 105 | 424 |
| Northern | 177 | 219 | 108 | 133 | 69 | 86 | 144 |
| Upper | 284 | 242 | 157 | 126 | 127 | 116 | 261 |
| Ghana | 1,644 | 1,850 | 925 | 939 | 719 | 911 | 291 |

Source: B.F. Rourke, "Rural Employment and Labor Productivity in Ghana", Mimeo. ISSER, March 1974.

greater than the rate of increase in adult population.

The pattern of change in the work force varied regionally. In the Upper region, during the decade, the absolute number of males and females active in agriculture has declined. In the Volta Region, the total number of males engaged in agriculture was the same but declined in the Eastern region. In 1970, the female work force actually exceeded the male work force in the Western, Central and Ashanti regions.

The agricultural product per worker in Ghana was estimated at ¢291.00 per annum. The average product varies regionally from a low of ¢144.00 in the Northern region to over ¢420.00 in the Ashanti and Brong/Ahafo regions. Cocoa is dominant throughout the Ashanti region and in the forest belt of the Brong-Ahafo region which covers about one-third of the land area of that region. The average product would be lower if child labor were included in the agricultural work force. This is particularly true for Northern Ghana .

Average agricultural product in 1970/71 was higher than the Government minimum wage income which was set at ¢243.00/year.

C. Agriculture and The Balance of Payments.

Since the early 1960's Ghana's growth rate has been hampered by a shortage of foreign exchange. The country has not had the foreign exchange reserves required to support a moderate rate of growth in GDP. While it was believed that the debt relief provided by the recent rescheduling of Ghana's medium term debts, and the additional aid commitments that were expected to follow from the resolution of the debt issue, would reduce this constraint to manageable limits, the impact of the oil crisis has probably eliminated this possibility. Thus, Ghana most likely will have to manage with a resource gap for the rest of the 1970's.

The agricultural sector has made substantial contributions to Ghana's foreign exchange earning in both absolute and relative terms. As Table 3 indicates agricultural and forestry related products contributed between 69.1 percent and 80.5 percent of Ghana's annual foreign exchange earnings over the period 1966 to 1975. The fact that Ghana has had foreign exchange available to finance development and consumption is thus due almost entirely to the performance of the agricultural sector.

This success must be qualified however in that it has resulted almost entirely from the exportation of cocoa and cocoa products. This overdependence upon cocoa has

Table 3: Agricultural and Forestry Related Exports
1966 - 1973
(Millions of Cedis)

| | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|---|---|
| Food and Live Animals | 119.6 | 159.0 | 219.3 | 189.3 | 337.5 | 228.4 | 334.3 | 404.3 |
| a) Cocoa and Cocoa Products | 116.4 | 156.3 | 215.1 | 185.7 | 331.7 | 222.9 | 328.2 | 397.3 |
| b) Coffee and Coffee Preparations | 2.2 | 1.2 | 2.6 | 1.6 | 3.2 | 2.5 | 3.4 | 2.9 |
| Crude Agricultural Materials | 22.3 | 23.8 | 29.6 | 40.8 | 37.7 | 34.0 | 65.2 | 133.0 |
| a) Wood, Lumber and Cork | 20.9 | 22.5 | 28.7 | 39.5 | 37.4 | 32.9 | 63.7 | 130.6 |
| Animal and Vegetable Oils and Fats | .1 | .3 | 0.0 | 0.1 | .3 | .1 | .2 | .1 |
| Total of Above | 142.0 | 183.1 | 248.9 | 230.2 | 375.5 | 262.5 | 399.7 | 537.4 |
| Total Exports of All Items | 191.4 | 245.1 | 338.8 | 333.3 | 467.4 | 357.5 | 564.4 | 730.4 |
| Total Agricultural/Forestry Exports as a per cent of Total Exports of All Items | 74.2% | 74.7% | 73.5% | 69.1% | 80.3% | 73.4% | 70.8% | 73.6% |
| Cocoa and Cocoa Products as a Per cent of Total Exports of All Items | 60.8% | 63.8% | 63.5% | 55.7% | 71.0% | 62.4% | 58.2% | 54.4% |

Source: External Trade Statistics of Ghana (various years)

led to a substantial amount of variability in Ghana's foreign exchange earnings; a variability that has made it difficult to mobilize resources for development and rationally plan their allocation.

At the same time however Ghanaian agriculture has failed to produce and market the food (and raw materials) demanded by the growing economy. Up until the late 1960's the availability of domestic food production kept pace with expanding effective demand.

Since that time however it has been necessary to augment domestic production with increasing quantitiesof imported foodstuffs. Imports of food and live animals amounted 20.6, 16.2, 19.0, 14.1, 15.9, 18.5 percent of Ghana's total merchandise imports in 1966, 1968, 1970, 1971, 1972, and 1973 respectively.

The last three successive governments have sought to provide increased incentives and opportunity for the private farmer , so that Ghana's dependence upon food and raw material imports can be significantly reduced or eliminated. The results to date indicate that this effort has not been successful. As Table 4 shows, imports of food and live animals remain a significant percentage of Ghana's import bill. Table 5 illustrates that substantial foreign exchange economies could be affected through well selected and designed import substitution programs.

Table 4: Total Ghanaian Imports, 1971-1973

(Millions of U. S. Dollars)

| | 1971 | 1972 | 1973 | 1972 as a % of 1971 | 1973 as a % of 1971 |
|---|---|---|---|---|---|
| Total Merchandise Imports | 434.28 | 283.74 | 438.25 | | |
| Imports of Food and Live Animals as a per cent of Total Merchandise Imports | 14.13% | 15.89% | 18.47% | | |
| Food and Live Animals | 61.34 | 45.09 | 80.96 | 73.5 | 132.0 |
| Live Animals | 6.01 | 3.70 | 4.69 | 61.6 | 78.0 |
| Meat and Meat Preparations | 3.63 | 1.99 | 2.06 | 54.8 | 56.8 |
| Dairy Products and Eggs | 10.97 | 5.68 | 6.83 | 51.8 | 62.3 |
| Fish and Fish Preparations | 11.46 | 8.80 | 10.24 | 76.8 | 89.4 |
| Cereals and Ceral Preparations | 13.13 | 11.67 | 33.77 | 88.9 | 257.2 |
| Fruits and Vegetables | 1.68 | .66 | 1.28 | 39.3 | 76.2 |
| Sugar, Sugar Preparations and Honey | 10.32 | 10.55 | 18.13 | 102.2 | 175.7 |
| Coffee, Tea, Cocoa, Spices and Manufactures thereof | .98 | .36 | .91 | 36.7 | 92.9 |
| Feeding Stuff for Animals not including unmilled cereals | .77 | .82 | 2.06 | 106.5 | 267.5 |
| Miscellaneous Food Preparations | 2.39 | .87 | 1.01 | 36.4 | 42.3 |

Source: External Trade Statistics of Ghana (various years)

Table 5 Selected Agricultural Imports 1966-1973

(in millions of cedis)

| | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|---|---|
| Live Animals/Meat and Meat Preparations | 7.9 | 10.0 | 9.1 | 11.9 | 12.7 | 9.8 | 7.7 | 7.8 |
| Fish and Fish Preparations | 5.2 | 3.7 | 4.5 | 4.9 | 13.9 | 11.7 | 11.8 | 11.8 |
| Sugar, Sugar Preparations and Honey | 5.2 | 5.4 | 8.4 | 8.5 | 16.5 | 10.5 | 14.2 | 21.0 |
| Animal and Vegetable Oils & Fats | 2.6 | 3.4 | 4.0 | 5.9 | 3.8 | 5.3 | 5.2 | 6.0 |
| Cotton (fibre) | .7 | .9 | 3.1 | 1.9 | 5.4 | 4.7 | 7.3 | 12.3 |
| Jute (fibre) | .4 | .9 | 1.1 | .8 | 1.4 | 1.3 | 1.1 | 1.8 |
| Tobacco and Tobacco Manufacturers | 1.4 | 2.6 | 3.9 | .4 | 2.1 | 3.1 | 1.5 | 2.6 |
| Total Selected Imports | 23.4 | 26.9 | 34.1 | 34.3 | 55.8 | 46.4 | 48.8 | 63.3 |
| Total Merchandise Imports | 251.2 | 261.5 | 314.0 | 354.4 | 419.1 | 443.1 | 381.7 | 508.1 |
| Total Selected Imports as Per cent of Total Merchandise Imports | 9.3% | 10.3% | 10.9% | 9.7% | 13.3% | 10.5% | 12.8% | 12.5% |

* Imports, most of which could very likely be produced domestically.

Source: External Trade Statistics of Ghana (Various years)

D. Agriculture and Government Expenditures.

Table 6 indicates that both current and capital expenditures by the Ministry of Agriculture have increased both relatively and absolutely over recent fiscal years. At the same time however the amount budgeted remains low in absolute and relative terms. This fact is particularly striking due to the large role played by agriculture in the economy and the announced priorities of the Government. It should be noted however that the expenditure data of Table 7 refers only to those expenditures undertaken by the Ministry of Agriculture. A number of other institutions, most notably the Cocoa Marketing Board and the Agricultural Development Bank also undertake expenditures and loan resources in support of agricultural development. Private investors have also undertaken substantial investments in agriculture (though the precise magnitude of such investments is not known).

Table 7 breaks down budgeted current and capital expenditures (Ministry of Agriculture only) for FY 1974 and FY 1975 into categories of expenditure. It is meaningful to note that increased expenditure for personal emoluments, maintenance and repairs, and renewals accounted for almost 50 percent of the increase in budgeted current and capital expenditures from FY 1974 to FY 1975.

A persistent budgetary problem in Ghana has been the tendency for ministries to exceed their budget for

TABLE 6

## Government of Ghana Expenditures for Selected Ministries

(millions of cedis)

| | Actual 1970-71 | | | Actual 1971-72 | | | Actual 1972-73 | | | Budget Est. 1973-74 | | | Budget Est. 1974-75 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current | Capital | Total | Current | Capital | Total | Current | Capital | Total | Current | Capital | Total | Current | Capital | Total |
| Agriculture | 18.4 | 9.1 | 27.4 | 24.6 | 5.1 | 29.7 | 29.1 | 6.6 | 35.6 | 16.6 | 14.1 | 30.7 | 22.2 | 23.0 | 45.2 |
| Construction | 12.2 | 36.5 | 48.7 | 15.3 | 25.7 | 41.0 | 20.1 | 39.7 | 59.8 | 24.5 | 42.8 | 67.3 | 33.2 | 57.3 | 90.5 |
| Education, Culture & Sports | 65.2 | 7.5 | 72.6 | 71.0 | 7.3 | 78.3 | 97.5 | 6.0 | 103.5 | 85.3 | 7.7 | 93.0 | 104.3 | 17.2 | 121.5 |
| Health | 28.7 | 5.7 | 34.5 | 25.0 | 9.0 | 34.0 | 31.0 | 11.0 | 42.0 | 44.9 | 9.5 | 54.4 | 69.1 | 12.7 | 81.8 |
| General Administration | 50.3 | 18.0 | 68.3 | 54.1 | 18.1 | 72.2 | 25.7 | 8.2 | 33.9 | 51.1 | 14.7 | 65.8 | 66.3 | 19.8 | 86.1 |
| Fiscal Administration | 11.8 | 7.8 | 19.6 | 17.0 | 4.0 | 21.1 | 40.7 | 6.6 | 47.4 | 57.0 | 13.4 | 70.4 | 99.7 | 26.3 | 126.0 |
| Defense | 36.1 | 6.7 | 42.7 | 35.9 | 6.8 | 42.7 | 34.8 | 2.5 | 37.3 | 42.7 | 9.8 | 52.5 | 62.8 | 33.0 | 95.8 |
| Financial Services | 93.7 | --- | 93.7 | 120.4 | --- | 120.4 | 116.3 | --- | 116.3 | 117.8 | --- | 117.8 | 161.9 | --- | 161.9 |
| Other Sectors | 61.8 | 17.1 | 79.2 | 67.4 | 27.8 | 95.1 | 53.9 | 15.4 | 69.3 | 64.5 | 32.9 | 97.4 | 96.5 | 56.9 | 153.4 |
| Total | 378.3 | 108.4 | 486.7 | 430.7 | 103.8 | 534.5 | 449.1 | 96.0 | 545.1 | 504.4 | 144.9 | 649.3 | 716.0 | 246.2 | 962.2 |
| Percent | | | | | | | | | | | | | | | |
| Agriculture | 4.86 | 8.40 | 5.63 | 5.71 | 4.91 | 5.56 | 6.48 | 6.88 | 6.53 | 3.29 | 9.73 | 4.73 | 3.10 | 9.34 | 4.70 |
| Construction | 3.23 | 33.67 | 10.01 | 3.55 | 24.76 | 7.67 | 4.48 | 41.35 | 10.97 | 4.86 | 29.54 | 10.37 | 4.64 | 23.27 | 9.41 |
| Education, Culture & Sports | 17.24 | 6.92 | 14.92 | 16.49 | 7.03 | 14.65 | 21.71 | 6.25 | 18.99 | 16.91 | 5.31 | 14.32 | 14.57 | 6.99 | 12.63 |
| Health | 7.61 | 5.26 | 7.09 | 5.81 | 8.67 | 6.36 | 6.90 | 11.46 | 7.71 | 8.90 | 6.56 | 8.38 | 9.65 | 5.16 | 8.50 |
| General Administration | 13.30 | 16.61 | 14.03 | 12.56 | 17.44 | 13.51 | 5.72 | 8.54 | 6.22 | 10.13 | 10.15 | 10.13 | 9.26 | 8.04 | 8.95 |
| Fiscal Administration | 3.12 | 7.20 | 4.03 | 3.95 | 3.85 | 3.95 | 9.06 | 6.88 | 8.70 | 11.30 | 9.25 | 10.84 | 13.93 | 10.68 | 13.10 |
| Defense | 9.54 | 6.18 | 8.77 | 8.34 | 6.55 | 7.99 | 7.75 | 2.60 | 6.84 | 8.47 | 6.76 | 8.09 | 8.77 | 13.40 | 9.96 |
| Financial Services | 24.77 | ---- | 19.25 | 27.96 | --- | 22.53 | 25.90 | --- | 21.34 | 23.36 | --- | 18.14 | 22.61 | --- | 16.83 |
| Other Sectors | 16.34 | 15.78 | 16.27 | 15.65 | 26.79 | 17.79 | 12.00 | 16.04 | 12.71 | 12.79 | 22.71 | 15.00 | 13.48 | 23.11 | 15.94 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Decline in current expenditure in FY 74 and FY 75 results from removal of Cocoa Division and Produce Inspection Division from portfolio of Ministry of Agriculture. Expenditures may be understated in all years due to utilization of subsidized fertilizer prices in development of expenditure estimates.

Source: General Memorandum and Financial Statement (various years)

Table 7: **Composition of Expenditures for Agriculture**

**(Millions of Cedis)**

| | Budget Est. FY 74 | Est.* FY 75 | % Change FY 74-75 | Change in Total Current Expenditures: Percentage Accounted for by | Change in Total Capital Expenditures FY 74 - 75 Percentage Accounted for by | Change in Total Current and Capital Expenditures FY 74-75 Percentage Accounted for by |
|---|---|---|---|---|---|---|
| Total Current Expenditures | 16.6 | 22.2 | + 33.7 | 100.00 | NA | NA |
| 1) Personal Emoluments | 7.5 | 9.8 | + 30.7 | 41.07 | NA | 15.86 |
| 2) Travelling & Transport | 1.8 | 1.9 | + 5.6 | 1.79 | NA | .69 |
| 3) Gen'l Expenditure | 1.0 | 1.2 | + 20.0 | 3.57 | NA | 1.38 |
| 4) Maintenance, Repairs and Renewals | 1.5 | 3.4 | +126.7 | 33.93 | NA | 13.10 |
| 5) Other Current Expenditure | 3.8 | 4.4 | + 15.8 | 10.71 | NA | 4.14 |
| 6) Subventions | 1.0 | 1.6 | + 60.0 | 10.71 | NA | 4.14 |
| Total Capital Expenditure | 14.1 | 23.0 | + 63.1 | NA | 100.00 | NA |
| 1) Constructional Works | 4.5 | 10.0 | +122.2 | NA | 61.80 | 37.93 |
| 2) Plant, Furniture, Equipment & Vehicles | 3.5 | 5.8 | + 65.7 | NA | 25.04 | 15.86 |
| 3) Other Capital Expenditure | 6.2 | 7.3 | + 17.7 | NA | 12.36 | 7.59 |
| Total Current and Capital Expenditure | 30.7 | 45.2 | + 47.2 | NA | NA | 100.00 |

No breakdown is available for actual expenditures in these or earlier fiscal years.

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Source: The Annual Estimates: Agriculture FY 1974 and FY 1975

recurrent expenditures and to fall short of their budget with respect to capital or development expenditures. Table 8 examines the performance of the Ministry of Agriculture in this respect as compared to all ministries as a group. The Ministry of Agriculture, as the table reveals, has performed reasonably well with respect to recurrent expenditures thus holding actual recurrent expenditures approximately in line with budget estimates. On the capital expenditure side its performance has been decidedly inferior. The shortfall of actual capital expenditures below budget estimates has, as a percentage of the budget estimate, been significantly above the level of shortfall for all ministries taken as a group. In FY 1972 and FY 1973, with the Government of Ghana attempting to hold such shortfalls of capital expenditure to a minimum, the ministries as a whole had shortfalls of capital expenditure that amounted to 10.5 percent and 4.4 percent of budgeted expenditure as against shortfalls of 20-30 percent from FY 1967 to FY 1971. At the same time shortfalls in capital expenditure remained significantly large in the Ministry of Agriculture during FY 1972 and FY 1973. This would suggest that administrative and management problems within the Ministry of Agriculture are hindering the implementation and completion of development related activities.

TABLE 8 ACTUAL EXPENDITURES AS OPPOSED TO EXPENDITURE ESTIMATES AGRICULTURE AND ALL MINISTRIES
(MILLIONS OF CEDIS)

| | FY 1967 | FY 1968 | FY 1969 | FY 1970 | FY 1971 | FY 1972 | FY 1973 | Compound annual growth FY 1967-FY 1973 |
|---|---|---|---|---|---|---|---|---|
| **ACTUAL** | | | | | | | | |
| Total Expenditures for Agriculture | 18.3 | 19.2 | 20.4 | 21.2 | 27.5 | 29.7 | 35.7 | 11.8% |
| a) Recurrent | 10.2 | 11.3 | 12.8 | 13.9 | 18.4 | 24.6 | 29.1 | 19.1% |
| b) Capital | 8.1 | 7.9 | 7.6 | 7.3 | 9.1 | 5.1 | 6.6 | 3.4% |
| Total Expenditures for All Ministries | 302.3 | 370.5 | 382.5 | 457.7 | 486.7 | 534.5 | 545.1 | 10.3% |
| a) Recurrent | 226.9 | 298.1 | 317.2 | 373.7 | 378.3 | 430.7 | 449.1 | 12.1% |
| b) Capital | 75.4 | 72.4 | 65.3 | 84.0 | 108.4 | 103.8 | 96.0 | 4.1% |
| **Budget Estimate** | | | | | | | | |
| Total Expenditures for Agriculture | 27.9 | 21.1 | 23.9 | 26.6 | 30.9 | 33.8 | 39.3 | |
| a) Recurrent | 10.1 | 11.3 | 12.8 | 14.3 | 18.9 | 26.8 | 30.4 | |
| b) Capital | 17.8 | 9.8 | 11.1 | 12.3 | 12.0 | 7.0 | 8.9 | |
| Total Expenditures for All Ministries | 334.4 | 393.2 | 429.3 | 468.7 | 519.7 | 546.4 | 608.4 | |
| a) Recurrent | 209.7 | 303.8 | 324.7 | 346.1 | 382.2 | 430.4 | 503.0 | |
| b) Capital | 124.7 | 89.4 | 104.6 | 122.6 | 137.5 | 116.0 | 105.4 | |
| **Actual Minus Budget Estimate** | | | | | | | | |
| Total Expenditures for Agriculture | - 9.6 | - 1.9 | - 3.5 | - 5.4 | - 3.4 | - 4.1 | - 3.6 | |
| a) Recurrent | .1 | 0.0 | 0.0 | - .4 | - .5 | - 2.2 | - 1.3 | |
| b) Capital | - 9.7 | - 1.9 | - 3.5 | - 5.0 | - 2.9 | - 1.9 | - 2.3 | |
| Total Expenditures for All Ministries | - 32.1 | - 22.7 | - 46.8 | - 11.0 | - 33.0 | - 11.9 | - 58.3 | |
| a) Recurrent | 17.2 | - 5.7 | - 7.5 | 27.6 | - 3.9 | .3 | - 53.9 | |
| b) Capital | - 49.3 | - 17.0 | - 39.3 | - 38.6 | - 29.1 | - 12.2 | - 4.4 | |
| **Shortfall or Excess Expenditure As a Percent of Budget Estimate** | | | | | | | | |
| Total Expenditures for Agriculture | - 34.4% | - 9.0% | - 14.6% | - 20.3% | - 11.0% | - 12.1% | - 9.2% | |
| a) Recurrent | 1.0% | 0.0% | 0.0% | - 2.8% | - 2.7% | - 8.2% | - 4.3% | |
| b) Capital | - 54.5% | - 19.4% | - 31.5% | - 40.7% | - 24.2% | - 27.1% | - 25.8% | |
| Total Expenditures for All Ministries | - 9.6% | - 5.8% | - 10.9% | - 2.4% | - 6.4% | - 2.2% | - 9.7% | |
| a) Recurrent | 8.2% | - 1.9% | - 2.3% | 8.0% | - 1.0% | .1% | - 10.7% | |
| b) Capital | - 39.5% | - 19.0% | - 37.4% | - 31.5% | - 21.2% | - 10.5% | - 4.4% | |

Source: General Memorandum and Financial Statement (various years)

E. Agriculture and Government Revenues.

As Table 9 indicates, export and local duties on cocoa provide a substantial amount of Ghana's tax revenues. Apart from the contribution of this subsector, agriculture's direct contribution to government revenues is quite small. This is true for two reasons.

First, agricultural equipment is subject to very low rates of import duty (most commonly a zero rate of duty). Thus agriculture contributes very little to this major source of tax revenue. As users of imported consumables farmers ultimately pay the duties imposed upon such items indirectly, but as most imported consumables are utilised by urban consumers this indirect contribution is probably relatively small.

Secondly, the contribution of agriculture to income tax revenues is quite small. This is due to a number of factors. First Ghana's numerous small holders have low incomes and are thus exempted from explicit taxation. Even where incomes are high enough to be subject to taxation, collection remains difficult. Another factor is the five year exemption from income tax for new farming activities. This was established in 1969 by the National Liberation Council in an effort to increase agricultural production. In practice it has suffered from administrative and other difficulties such that the cost in terms of revenue foregone may exceed the gains from increased production. Income from cocoa farming is exempt, without time limitation,

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Table 9: **Government of Ghana Tax Revenues**
**(millions of cedis)**

| | Actual FY 1967 | Actual FY 1968 | Actual FY 1969 | Actual FY 1970 | Actual FY 1971 | Actual FY 1972 | Actual FY 1973 | Revised Estimate FY 1974 | Budget Estimate FY 1975 |
|---|---|---|---|---|---|---|---|---|---|
| Import Duties | 67.3 | 59.4 | 55.9 | 67.5 | 128.2 | 90.0 | 60.7 | 116.8 | 118.1 |
| Export Duties | 32.0 | 69.7 | 73.6 | 114.3 | 178.1 | 110.4 | 92.5 | 173.6 | 200.7 |
| (Export Duties on Cocoa) | 31.2 | 69.0 | 72.9 | 113.6 | 177.5 | 109.6 | 91.5 | 164.0 | 195.0 |
| (Export Duties on Timber) | .7 | .7 | .6 | .7 | .6 | .8 | 1.0 | 8.5 | NA |
| Excise Duties and Local Duties on Cocoa | 25.1 | 30.6 | 32.1 | 38.3 | 48.5 | 45.3 | 57.9 | 78.1 | 100.2 |
| (Local Duties on Cocoa) | 3.4 | 8.6 | 7.0 | 11.3 | 19.0 | 12.8 | ---- | 5.7 | NA |
| Licenses | 7.0 | 7.2 | 6.4 | 5.9 | 6.2 | 3.0 | 1.5 | 2.7 | 4.2 |
| Miscellaneous Taxes on Production & Expenditure | 30.7 | 30.9 | 32.6 | 39.0 | 42.5 | 47.1 | 42.4 | 43.6 | 47.4 |
| (Sale Tax on Local Products) | -- | -- | -- | -- | -- | -- | 17.0 | 30.3 | 32.7 |
| Taxes on Income and Property | 54.8 | 57.5 | 59.5 | 69.1 | 63.4 | 76.5 | 99.2 | 110.1 | 137.8 |
| (Income Tax) | 49.3 | 52.1 | 53.4 | 64.3 | 59.5 | 66.8 | 77.4 | 93.2 | 120.0 |
| Grand Total Tax Revenues | 216.9 | 255.3 | 260.1 | 334.1 | 466.9 | 372.3 | 354.2 | 524.9 | 608.4 |
| Import Duties as a per cent of Total Tax Revenue | 31.0 | 23.3 | 21.5 | 20.2 | 27.5 | 24.2 | 17.1 | 22.3 | 19.4 |
| Export and Local Duties on Cocoa as a per cent of Total Tax Revenue | 16.0 | 30.4 | 30.7 | 37.4 | 42.1 | 32.9 | 25.8 | 32.3 | 32.1 |
| Taxes on Income and Property as a per cent of total Tax Revenue | 25.3 | 22.5 | 22.9 | 20.7 | 13.6 | 20.6 | 28.0 | 21.0 | 22.7 |
| Income Tax as a per cent of Total Tax Revenue | 22.7 | 20.4 | 20.5 | 19.3 | 12.8 | 17.9 | 21.9 | 17.8 | 19.7 |

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Source: General Memorandum and Financial Statement (various years).

from income taxation.

This is not to say that agriculture makes no contribution to income tax revenues. Larger poultry, maize and rice farmers who have been in operation for more than five years contribute but the proportion of total income tax revenues realised is undoubtedly small.

Non-cocoa agriculture could no doubt make a more substantial contribution to government revenues. A number of reforms to bring this about would seem desirable. It would, for example, seem desirable to impose higher rates of duty on agricultural equipment. Under the current system such equipment receives an implicit subsidy through the overvalued cedi which undoubtedly leads to uneconomic investment in capital intensive as opposed to labor intensive production techniques as well as reducing potential government revenues needed for development. Likewise it would seem advisable to eliminate the five year income tax exemption for agricultural income given the administrative problems associated with it and its probably limited effect on production.

An effort also needs to be made to reduce the disparity that now exists between cocoa farmers and non-cocoa farmers as far as explicit and implicit taxation is concerned. Ghana's share of the world market for cocoa has been declining in recent years. Much of this may be due to the incentive that the current price (implicit tax) system

provides to move from cocoa production to other crops.

These reforms, while desirable from an efficiency and equity point of view would also be beneficial in promoting fiscal stability in that they would help reduce Ghana's dependence upon cocoa as a source of revenue. All too often in the past, expenditures have been increased as additional revenues became available when the price of cocoa increased on the world market. While this is understandable the problem has been that new expenditures were difficult to reduce or eliminate when cocoa prices fell. The result has thus been additional deficit financing and a consequent build up in the inflationary pressures that have plagued the economy in recent years.

F. Agriculture and The Price Level.

As Table 10 indicates, Ghana has experienced a substantial amount of inflation in recent years. While many forces have operated to produce this result the primary cause lies in the inability of the Government of Ghana to balance its budget and the resulting deficit financing. In Fiscal Year 1975 alone it is estimated that the gross deficit will amount to ¢289.5 million or approximately thirty percent of total government expenditure.

It is of interest to note that most of the inflationary pressure inherent in the economy has tended to manifest itself through an increase in the price of local food

Table 10: **Impact of Inflationary Pressures 1967 to 1974**

| | June 1967 to June 1968 | June 1968 to June 1969 | June 1969 to June 1970 | June 1970 to June 1971 | June 1971 to June 1972 | June 1972 to June 1973 | June 1973 to June 1974 |
|---|---|---|---|---|---|---|---|
| Absolute Change in Overall Consumer Price Index (Points) | 5.37 | 22.28 | 3.45 | 30.68 | 26.36 | 14.34 | 52.45 |
| Percentage Change in Overall Consumer Price Index | 3.36% | 13.30% | 1.67% | 15.75% | 11.75% | 5.95% | 19.62% |
| All Items | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Local Food | 11.73 | 81.33 | 57.39 | 86.90 | 78.04 | 23.70 | 53.90 |
| Imported Food | 7.83 | .99 | --- | - .91 | 5.05 | 3.55 | 2.97 |
| Drink and Tobacco | 1.30 | .76 | 6.09 | 1.79 | 1.48 | 4.42 | 3.51 |
| Fuel and LIgh | -1.12 | 4.00 | 15.94 | .49 | 4.89 | 15.46 | 9.00 |
| Clothing | 42.09 | 10.55 | 7.54 | 6.85 | -1.25 | 27.98 | 13.38 |
| Health and Hygiene | 14.53 | 2.07 | -4.64 | 2.67 | 3.95 | 8.17 | 5.47 |
| Transport and Communications | - .56 | 1.12 | 8.12 | .20 | 2.20 | 1.61 | 4.77 |
| Durable Goods | 7.64 | - .05 | - .29 | .72 | 1.82 | 4.69 | 1.83 |
| Rent | .37 | .05 | -- | .03 | .08 | .07 | --- |
| Miscellaneous | 16.20 | - .81 | 9.86 | 1.27 | 3.76 | 10.38 | 5.17 |

Source: Central Bureau of Statistics Newsletter and Mission Computations. Weights used for All Items, Local Food.....Miscellaneous are 100.00, 52.07, 2.95, 5.33, 7.98, 13.84, 4.36, 3.47, 1.54, 2.24, 6.24 respectively.

particularly in those years when the rate of inflation has been highest. This would seem to suggest that a substantial portion of the excess purchasing power resulting from deficit financing is being directed toward the purchase of local food. It would also suggest that the response of local food suppliers to higher prices has been limited. A greater response on the part of suppliers would have reduced the impact of the inflationary pressures upon the price of food, an item which makes up approximately 50 percent of the consumption of low income consumers.

G. The Distribution of Regional and Rural Income.

Table 11 estimates, for 1960, the distribution of gross value added by regions and by sectors of origin.[1/]

In 1960, about 52 percent of the gross value added (GVA) in all industries originated in three regions: Greater Accra, Ashanti and the Eastern Region.[2/] In these three regions, 41 percent of the population was domiciled. Of the total GVA, 36.5 % was agriculture, 20.8% forestry and 10.9% cocoa. Services which were primarily public sector explained 37.4%of theGVA. Other important sectors were construction (10.3%) and mining, quarrying and manufacturing (7.3%). Within regions, agriculture (excluding forestry and cocoa) was most important in theVolta, Brong-Ahafo, Northern and Eastern Regions, respectively, explaining over 25 percent of total GVA. Except for the Eastern region, which is influenced by its proximity to Greater Accra, these three regions were in absolute terms the poorest regions in the country. They accounted for 26% of total GVA and 40% of the total population. On a regional basis there is some general evidence that per capita GVA varied inversely with the importance of agriculture in 1960.

1/ No comparable data, on a national basis, is available for a more recent period.

2/ GVA understates the gross value of agricultural production by excluding the value of subsistence.

TABLE 11: REGIONAL GROSS VALUE ADDED, BY SECTORS OF ORIGIN 1960 [1]

| Region | Total N¢ Millions | % | % of Pop. | Agric. % | N¢ Millions | Forestry % | N¢ Millions | Cocoa % | N¢ Millions | Services % | N¢ Millions | Const.+ % | % Millions | Mining & Manuf.% | N¢ Millions | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Composition by Sectors, Percent and Absolute Amounts | | | | | | | | | | | | | | | | |
| Greater Accra | 173.0 | 20.6 | 7.2 | 1.3 | 2.2 | .1 | .2 | - | - | 58.7 | 101.6 | 22.5 | 39.0 | 3.9 | 6.8 | 13.5 | 100.0 |
| Western and Central | 187.0 | 22.2 | 20.5 | 12.3 | 23.0 | 8.6 | 16.0 | 9.8 | 18.4 | 36.9 | 69.0 | 7.0 | 13.0 | 14.0 | 26.2 | 11.4 | 100.0 |
| Eastern | 115.0 | 13.7 | 16.3 | 24.9 | 28.6 | 4.3 | 5.0 | 13.7 | 15.8 | 31.1 | 35.8 | 5.9 | 6.8 | 15.3 | 17.6 | 4.8 | 100.0 |
| Volta | 67.0 | 8.0 | 11.6 | 42.7 | 28.6 | 3.3 | 2.2 | 9.9 | 6.6 | 31.9 | 21.4 | 6.3 | 4.2 | - | - | 5.9 | 100.0 |
| Ashanti | 150.4 | 17.9 | 16.5 | 17.2 | 25.8 | 5.2 | 7.8 | 21.1 | 31.8 | 35.6 | 53.6 | 7.4 | 11.2 | 7.0 | 10.6 | 6.5 | 100.0 |
| Brong-Ahafo | 71.2 | 8.5 | 8.7 | 34.6 | 24.6 | 8.7 | 6.2 | 26.7 | 19.0 | 22.2 | 15.8 | 4.2 | 3.0 | .3 | .2 | 3.2 | 100.0 |
| Northern and Upper | 77.6 | 9.2 | 19.2 | 54.9 | 42.6 | 4.4 | 3.4 | - | - | 22.9 | 17.8 | 10.1 | 7.8 | .3 | .2 | 7.4 | 100.0 |
| | 841.2 | 100.0 | 100.0 | 20.8 | 175.4 | 4.8 | 40.8 | 10.9 | 91.6 | 37.4 | 31 5.0 | 10.1 | 85.0 | 7.3 | 16.6 | 8.7 | 100.0 |

Source [1]: R. Szereszewski in "Regional Aspects of the Structure of theEconomy" in Study of Contemporary Ghana, Vol.I. 1966

[illegible]

The regional origin of total gross value added shows a marked concentration of economic activity in the Southern parts of Ghana, particularly the forest belt (the Ashanti, Eastern and parts of the Western, Central and Brong-Ahafo regions). The average gross value added per person in Ghana was ¢126.00 in 1960 ranging from ¢352.00 in Greater Accra and ¢60.00 in the Northern and Upper Regions. Total GVA represented about 80 % of Gross Domestic Product in 1960.[1/]

[illegible]

lued at ¢414.00 ranging from ¢9,734 for persons engaged in fuel, ¢2,200 in manufacturing, ¢2,184 in logging and the lowest, ¢182.00 for people engaged in agriculture.

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1/ R.Szereszewski, "Sectoral Structure of the Economy," In Study of Contemporary Ghana. Vol.1, 1966.

H. Agriculture and The Ghanaian Economy.

The performance of the agricultural sector has exceeded the performance of the economy as a whole over the years since the NRC came to power. As a result of import restrictions, overall economic activity has declined from levels experienced prior to 1972. A clear priority with respect to agriculture, plus the fact that the sector is relatively less dependent upon imports, has allowed the sector to continue to perform relatively well. This is especially true for the 1973 crop year. Table 12 shows national acreage and production estimates for the most important food crops for the period 1970 to 1973. Compared to 1970/71, one of the best harvest years of the preceding decade, the growth in real terms of major food crops was negative during the 1970-73 period. Compared to 1972, a relatively bad crop year, the increase in production in 1973 was considerable. Cereal production in 1973 was equal to 1970 levels and grain legume production above 1970 levels. Production of starches in 1972 were substantially below 1970/71 levels but in 1973 increased considerably above 1972. Preliminary estimates for 1974 harvests indicate good harvests for cereals and grain legumes. There are no preliminary estimates for starches.

TABLE 12: NATIONAL ACREAGE AND PRODUCTION ESTIMATES FOR THE MAJOR FOOD CROPS FOR THE PERIOD 1970 TO 1973

| | 70/71 | 72 | 73 | Growth Rate 1972-73 % | Annual Growth Rate 1970/71-73 |
|---|---|---|---|---|---|
| **Cereals** | | | | | |
| Acreage (Acres 000's) | 2251 | 1825 | 2071 | 13.5 | -4.1 |
| Production (Tons 000's) | 722 | 682.5 | 721.3 | 14.8 | 0.0 |
| **Grain Legumes** | | | | | |
| Acreage | 541 | 479 | NA | - | - |
| Production | 100.0 | 96.8 | 126.8 | 31.0 | 12.6 |
| **Starches** | | | | | |
| Acreage | 2375 | 2415 | 2641 | 9.4 | 5.45 |
| Production | 8275.0 | 5686.4 | 6774.6 | 19.1 | -9.52 |

Source: Adapted from Ministry of Agriculture, Economics and Marketing Division "Agricultural Sample Census 1970" and "Annual Crop Production Surveys 1972 and 1973"

Agriculture, livestock, cocoa and forestry play a dominant role in the Ghanaian economy. In 1968, the latest year for which official data is available, these activities accounted for some 42 percent of Ghana's Gross Domestic Product. As large as this figure is, it should be remembered that in a very real sense it understates the importance of these activities to the economy in that many of the other sectors that contribute to Gross Domestic Product depend upon agriculture, livestock, cocoa and forestry as the basis for their existence. Though no data has been published to date it

seems likely that, given the priorities of the NRC, the proportion of Gross Domestic Product accounted for by agriculture, livestock, cocoa and forestry has increased in recent years.

# CHAPTER III - STRUCTURE OF AGRICULTURAL SECTOR

## III. STRUCUTRE OF THE AGRICULTURAL SECTOR

### A. Selected Ecological Factors and Land Use Patterns

When describing the physical environment of Ghana it is often said that the country comprises of two zones, the northern savanna and the southern forest zone. However, this simple dicotomy does not adequately reflect the diversity of climate, vegetation, and cropping patterns in various parts of the country.

These factors are basic determinants of agricultural production and must be considered and understood when formulating agricultural policy, planning production programs, and implementing changes in current production practices at the local level.

#### 1. Major Climatic Zones.

On the basis of a classification system developed by Papadakis 1/ there are four principal climatic belts as follows:

a) The Forest Belt having humid, semi-hot, equatorial climates. The forest belt comprises an area of about 32,000 sq. miles or 34 % of Ghana's total land area. The belt is contained within the Western and Central regions, two thirds of the Ashanti and Eastern regions, one third of the Brong-Ahafo region and about one-eighth of the Volta region.

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1/ J. Papadakis. Crop Ecologic Survey in West Africa, Vol.I. Rome, FAO, 1966.

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b) The Guinean Savanna or Middle Belt having hot tropical climates. The middle belt comprises the largest land area of Ghana, or about 52 % of Ghana's land area, and is contained in the Upper and Northern Regions and about one third of the Brong-Ahafo region.

c) The Dry Coastal Belt having dry, semi-hot climates. It is limited to a narrow belt along the coast extending from midway between Cape Coast and Takoradi and extends eastward to the Togo border and beyond.

d) The Forestless Highlands having humid tierra templada climates, is contained in the summits of the Togo mountains of the Volta Region.

Each of the climatic belts can be subdivided according to the duration of the dry season(s) , the absolute level and distribution of rainfall and evapo-transpiration rates. These aspects of climate together with the physical characteristics of the soils are the predominant determinants of cropping patterns within and among the ecological zones of Ghana.

2. Soils.

The most important features of the tropical soils in Ghana are the poor physical and chemical characteristics of the sub-soil. This is evidenced by the high kaoline content of the clays causing leaching, low cation absorbing capacities and low nutrient contents. Also, soils generally have a high iron content giving many red soils concretionary horisons or iron pans.

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Papadakis classified tropical soils according to their concretionary and latosolic profiles, the latter rich in free iron but poor in concretions of gravel size, the former having horizons rich in gravel size concretions.

Cation exchange capacity of tropical soils is primarily determined by organic matter and explains why the sum of absorbed cations decreases rapidly with depth. Soils in the forest belt accumulate organic matter more rapidly than those in the guinnea savanna belt due to leaf fall and the resulting slower rate at which humus oxidised. The acidity of soils in the forest belt varies directly with rainfall. In the humid forest belt, soils are more gravelly and therefore susceptible to erosion.

Soils vary in their bases content according to the S/clay ratios of their top-soils. Soils having S/clay ratios above 0.25 (eutrophic) are the Ghanaian ochrosols where cocoa and yams grow well. They are well provided with bases and the pH content is neutral but acidity increases with depth.

Those soils having S/clay ratios below 0.25 (dystrophic) belong to the Ghanaian oxisols which are poor in bases and acidic. Cocoa is not grown and yams are seldom grown on these soils. On these soils, which are predominant in the south-west, rice is usually the first crop after fallow followed by cassava; very short cropping periods of not more than two years are typical. On the ochrosols, yams follow long fallows and are in turn followed by maize. If population pressure does not permit long fallows maize is commonly grown after fallow.

The ferruginous soils which are rich in free iron, are the most important throughout West Africa and predominate the savanna ochrosols. They are fairly fertile and groundnuts respond well to phosphorous. Loss of iron leads to structural instabilities and under intense cultivation lose their organic matter and become susceptible to erosion. The top soils in this classification are well provided with bases but the sub-soils are characterised by intense leaching.

The forest ochrosols, under cocoa and yams, are ferralitic and their sub-soils have been subject to moderate levels of leaching. Ground-water laterites are soils with bad drainage and are commonly under rice in the Voltaian Basin. Vertisols (dark clays) are encountered in the Lower Volta Plains and are very fertile. However, they are avoided by farmers because they are poorly drained and difficult to till with hoes.

3. Rainfall and Temperature.

Rainfall among the four climatic zones is extremely variable in terms of annual totals, averages, distribution, timing, duration and intensity. In the forest belt, where rainfall is in excess of transpiration rates, the amounts range from 45 to 70+ inches per annum in two equal maximum peaks allowing for sequential harvest of annual crops. The length of the effective dry season seldom exceeds three months in a year.

In the guinnea savanna belt annual rainfall ranges between 40 and 50 inches with a single maximum peak in late August and early September.

The effective dry season extends to 5 - 5½ months per year. Two effective maximum peaks (rainfall) occur in its southernmost parts, where rainfall ranges from 45 - 60 inches/year. The eastern part of the coastal belt has the lowest average total rainfall in Ghana ranging from 25 - 35 inches per annum. A single effective maximum occurs in May - June. The Western coastal belt bordering on the forest zone has higher rainfalls of about 30 - 45 inches per annum with an effective major and a minor peak.

Throughout Ghana the average duration of the rains is between 2 to 3 hours and the average total duration in the wet months ranges from 30 to 40 hours.

Temperatures are high with little variation from year to year and annual means do not vary greatly throughoutGhana. The average maximum is highest in March (85°F on the coast and 94°F in the extreme north) and average minimum temperatures (70° - 75°F) are usually lowest in January except on the coast where they are lowest in August and in the extreme north where they are lowest in December.

The humidity, or amount of water vapour of the air, varies little during the day. Vapour pressures are high (25 - 30 inches) in the forest belt and the southern parts of Ghana. In the guinnea savanna zone they are lower, ranging between 5 - 15 inches. Relative humidities in the south are over 90 % throughout the year reaching 95 - 100 % on the coast. In the north, humidity is highest between

April to October reaching peaks, in the night, of 95 %. Otherwise relative humidities are below 80 % and fall to 25 % in the extreme north in January.

4. Vegetation.

The nature and distribution of vegetation is determined by the interaction of the chemical content or bases of the soil and climatic elements of temperature, humidity and rainfall. In addition to these factors, population pressure, land rotation and burning affect soil characteristics and vegetation.

In Ghana rainfall in terms of absolute amounts and seasonal distribution has a major influence on the vegetation of any particular region. The highest rainfall occurs in the extreme southwest or in the rainforest area. Somewhat less is recorded in the rest of the southwest and in the Volta Region or in the moist, semi-deciduous forest areas. To the north average rainfall declines and forest gives way to the guinnea savanna woodland.

5 2. Major Ecological Regions.

Within the four climatic zones described previously there are nine distinct ecological zones within Ghana. Within these ecological zones the climate is uniform and soils have definite similarities. Thus, within these ecological zone there is a uniform pattern of crop ecology which can be identified as follows:

a) Coconut sands, primarily contained in narrow coastal strips where coconut is the only plantation crop and cassava and maize are the major food crops.

b) Forest with poor soil bases are found in Western Ghana and are common in the Western region. These soils are too poor for cocoa, and yams are seldom grown; rice and cassava are the major food crops.

c) Forest with top-soils well provided with bases. In these soils cocoa and yams grow well when planted on cleared forest or bush fallow. These soils are most common in the forests of the Eastern Region and parts of Central, Ashanti and Brong-Ahafo Regions.

d) Terres de Barre have deep red soils, are poor in concretions and with latosolic profiles; their top soils are well provided with bases and permit extensive maize cultivation in the south-eastern parts of Ghana near the Togo border. Irrigation and flooding are common near river valleys (dark clay-vertisols) and on hydromorphic soils.

e) Lower Volta Plains are located in south-west Ghana in the drier parts of the forest belt. Soils are young and well provided with bases. The black earth is difficult to cultivate with hoes and are often too saline and alkaline. Here, with irrigation and mechanisation, rice and sugarcane are grown. Livestock is common in these areas.

f) Coastal Savanna along Ghana's coast is characterised by low rainfall, high humidity and consequent low evaporation. Unlike the guinnean savanna, the dry seasons are short. In its drier parts (4 or more dry months) maize and cassava predominate. Bordering the forest zone in the west, some coconut and oil palms are grown in the flooded soils; otherwise citrus, maize, and cassava predominate.

g) Guinean Savanna or middle belt is the predominant ecological region throughout West Africa. Soils are well drained, frequently rich in concretions, but in some upland areas soils are limited by iron pans near the surface and gravel concretions. Like the coastal savanna the climate is too dry for plantation crops. Groundnuts cannot be harvested early, yet late harvests are frequently attacked by disease (Rosette). The zone is sparsely populated with the exception of parts of the Upper Region, and the principal food crops are sorghum (guinea corn) millet, maize, yams and cassava. In the flood plains known as "fadamas", rice predominates.

h) Voltaian Basin occupies much of the mid and eastern part of Ghana and has generally poor drainage. Ground water laterites are common and some soils are poor in bases due to unweatherable minerals and rocks. Flood regulation, drainage control and/or irrigation is required. On the well-

drained soils in humid climates, cocoa, maize, yam and cassava grow well. Cocoa is more marginal in the guinnea savanna climate having at least seven humid months, but rice can grow in swamps. In areas having less humid months, sorghum and millet become more common and yams less common; this soil type distinguishes Ghana from other parts of West Africa. Throughout West Africa, ecological zones are parallel to the coast; however, in Ghana the distribution of ecological zones is not as uniform. The Voltaian Basin extends like a wedge from midway up the Togo border and narrows as it moves east and ends in central or mid Ghana.

i) Tierra Templada in the Volta Region has cool nights, and is characterized by temperate climate crops such as potatoes, coffee and vegetables. In this zone grasses have higher nutritive value than other parts of the country giving rise to better livestock production possibilities.

6. Some Resulting Characteristics of Land Use.[1]

To maintain soil fertility and to obtain annual food and cash requirements for his household, the smallholder has developed an intricate and complex system of land use. It is characterised, throughout Ghana, by two features, land rotation and mixed cropping.

To maintain soil fertility requires long periods of fallow in relation to a cropping period of 1 - 3 years. The length of fallow required varies between ecological zones; generally it is 6 - 8 years

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1/ Much of this section is attributed to a discussion with Dr.B. Okigbo of IITA at Ibadan, Nigeria.

with longer fallow required in the forest zone to enable regrowth of secondary forests (10 or more years). However, the length and frequency of fallow actually practised is related to population densities and degree of commercialisation.

The requirements of long fallow periods have resulted in what is commonly defined as land rotation; it differs from shifting cultivation in that several small farms or fields are cultivated or fallowed around permanently established holdings. With low population densities and abundance of arable land resources, land rotation and traditional farming practices have done well in maintaining soil fertility and safeguarding the delicate balance between the exploitation and regeneration of Ghana's soils. With increasing population densities and commercialisation the system of land rotation has in some cases been modified and in other cases completely given over to continuous cropping. For example, in the forest zone, the introduction of cash crops such as cocoa has modified land rotation to the extent of the period that trees remain yielding (30 years). This is merely an extension of the rotation cycle of clearing, cropping and fallow. Near urban centers in the forest zone, however, fallow periods are shorter (4 years) though more frequently repeated, to conform to the requirements of profitability rather than of maintaining soil fertility. It is reported that t he productivity of such land has become much reduced, but the extent has not been fully determined. In areas of extreme population densities (700 - 900 persons per sq. mile) such as the extreme north-east and

north-west of the savanna zone, the system of land rotation has been replaced by compound farming which is characterised by continuous cropping with use of manure. It is doubtful whether the use of manure is sufficient to maintain even present low levels of productivity over time.

Where fallows are being shortened by higher population densities the following consequencies have become evident:

a) loss of soil fertility;

b) soil degradation and erosion;

c) persistant weed growth;

d) poor yields and increasingly diminishing results from farming.

7k. Some Aspects of Traditional Cultivation Practices.

When forest soil is cleared, potential fertility is at its peak. In exposing the soil to the sun, organic matter decay is activitated, nutrients are liberated and the first crop will yield well. In the tropics the organic decay is rapid and fertility declines over a few years. Farmers, therefore, prefer to clear new land than to cultivate the old; in any case, when old land is abandoned the fallow will eventually reach its potential fertility and will again be cleared, burnt and cropped.

In the savanna the situation is slightly different. The fallow land contains grasses and their use in the soil slows down organic matter decay, reducing actual fertility. Maize usually suffers but

yam, with much inter tilling and a long growing period, will do better after fallow. Since grass is less effective in restoring organic matter than bush, fallows must be longer in the savanna.

The advantage of land rotation is that cleared land is more fertile and free of weeds which multiply under continuous cropping. A disadvantage of the traditional mode of cultivation is that the cropped area per holder is small owing to the fact that he is using a hand hoe and cutlass. If a farmer with the hand hoe attempted to till a larger land area he would be unable to control weed growth and a reduction in production per unit of labor would ensue.

Tillage is done by hand in the forest belt because forest areas when cleared contain roots and stumps, thus not permitting the use of the plow. In the savanna there is a greater potential use of the plow owing to vast open lands. Bullock plows are becoming more common in this area and tractor mechanisation is widely used in the fadama areas for large-scale rice production. The tractor is not widely used in other areas or for crops other than rice.

Throughout Ghana, especially in the savanna, most crops are sown on heaps and ridges because the seasonal surplus of rainfall is high. In addition, ridges are effective means to control weed growth and lessen the chances of erosion. After harvesting the crop, division of the heaps or mounds assists in reducing weed growth for the following year. The method of splitting ridges accumulates the top soils around the crops thereby favoring them as opposed to weeds.

A major characteristic of smallholder farming in Ghana is the practice of inter-or mixed-cropping. Cereal crops are typically grown with roots and tubers, legumes, vegetable crops and various perennials. Only very small acreages of the major staples are grown in pure stands or monoculture by small holders.

The most prevalent associations in a mixed cropping system among smallholders are the following:

a) Maize-sorghum-millet. This mixture predominates in the drier parts of the savanna; maize is sown early and sorghum is interplanted with the maize before it is harvested. After the maize is harvested the sorghum reaches full maturity and is then harvested. The parcel of land is thus densely planted reducing the chances for weed growth. Land is prepared once but produces two crops. Maize may at times be replaced with early millet and sorghum by late millet.

b) Yam-maize. Maize is planted at the end of the dry season and yams at the end of the humid season. Maize is harvested after 3 - 4 months while yams require several more months to mature. These crops do not affect each other's yield as yams are still young during the important months for maize and occupy little space. Maize impedes weed infestation and reduces the long periods of cultivation usually required by yams. Maize may be re-

placed by groundnuts, cowpeas, etc. depending on the ecological zone.

c) Maize-cotton. Maize is sown early and cotton is sown after maize is harvested. Since both are subject to common insects, groundnuts are preferred under less humid conditions and cowpeas are preferred in areas where cotton is affected by insects.

d) Cotton-yams. This mixture is a more frequent association than maize-yams. Cotton is sown late so that it does not grow much before yams have completed their growth. When yams are harvested all the space is available during the cotton flowering period.

e) Yams-maize-rice. Yams and maize are sown on heaps and ridges and during rainfall peaks the hollows (between the ridges) are flooded or wet so that rice can be grown. If the season is dry, rice will fail but yams and maize may grow well. If the season is too wet, only the rice may do well. Rice also protects against erosion; sometimes cotton is included on the heaps and ridges and continues after the rice harvest.

f) Cassava. Cassava is usually planted into another crop before harvests so as not to reduce the yield of its nursery crop. Of course, much labor is saved in this and other associations.

g) Legumes-non-legumes. These associations have many variations. The non-legumes receive nitrogen from the nitrogen-

fixing legumes, and the nitrogen fixation process is favored in the mixed stand, thus raising yields of both crops.

g) Cocoa-plantain-cocoyam. This mixture is prevalent throughout the forest zone where cocoa grows well; plantain provides shade for the young cocoa trees and cocoyams. The latter shade-loving crops thrive under this association. The association stops when cocoa matures.

h) Oil palms are also intercropped with plantain and cocoyams but the association continues throughout the life of the oil palm.

In most agriculturally advanced countries mixed cropping is not practised for several reasons. The main reasons that have favored monocropping in these countries have been temperate climates, vast areas of cleared land and more fertile soils. In the tropics, however, farmers have derived a system of mixing cropping over many generations. Outsiders have often advocated a switch to monocropping. However, it is crucial to recognise the advantages of the present cropping system. The major advantages are the following:

a) it maximizes output and stabilizes production per unit of area cultivated and per unit of labor utilized;

b) it reduces risk due to diseases and pests or adverse environmental conditions which may result in failure of one or more crops;

c) it facilitates the production of a range of food crops which ensure a more balanced diet in subsistance farming;

d) it represents a more stable agro-ecosystem as mono-cropping is more fragile;

e) it represents an efficient system of resource combination and management: it involves the production of compatible crops that utilize different nutrients at different levels; the growing of both shade and sun-loving together; provision of soil cover thereby reducing erosion; combination of crops that mature and harvest at different times of the year; and reducing the seasonal peak demands for family labor;

f) it is a reserve of germ plasm for future selection and crop improvement since the unimproved varieties consist of a mixture of genotypes, varieties and characteristics.

The major disadvantages of inter-cropping are:

a) it renders difficult the proper use or formulation of improved inputs such as fertilizer and pesticides;

b) it makes mechanization difficult or impossible;

c) it does not benefit from research which primarily focuses on "modern" farming practices under pure stand.

8 Summary.

In this section we have attempted to describe the climatic and ecological environment in which the Ghanaian farmer operates. The resulting patterns of land use and the major cropping patterns among smallholders have been described.

It has been shown that the smallholders have developed, over generations, a complex cropping pattern which is efficient given the ecological setting, the prevailing level of technology and the land and labor resources under their command.

Killick[1/] has described the system in the following way:

"The farmer in Ghana has had in the past to adopt his practice to a relative abundance of land, soils that easily become exhausted if farmed intensively, an acute scarcity of capital funds, and a shortage of alternative employment opportunities outside agriculture and petty trading. As a consequence, farming embodies techniques that will maintain the fertility of the soil with large inputs of land and labor relative to the small inputs of purchased capital goods."

Given the national drive and requirement to increase food production among smallholders, the production system must first be understood in order to insure that any proposed change will increase the productivity of the farmers labor, increase his income, and not involve a major risk which he has learned to avoid to a large degree. The farmer's priorities and decision-making process will be important factors in any program of change if new technology is to be adopted and sustained.

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1/ Tony Killick. "Agriculture and Forestry." In A Study of of Contemporary Ghana. Edited by Birmingham, Neustadt and Omaboe. Northwestern University Press, 1966.

The smallholder has until very recently been largely ignored. Research and extension has not provided the smallholder with a package of technology which is compatible with his system of intercropping or one in which the smallholder can identify appropriate components to adapt to his current and complex system of farming.

B. Land Tenure

1. Traditional Forms of Land Tenure.

Throughout rural Ghana the basic social and economic unit is the village and its communally-held land. Within the village the basic decision-making unit is the extended family, but it is restrained by its duties to and the rights of other families within the village or the community.

For the individual "the traditional mode of life is communal, therefore no Ghanaian stands alone; he is linked in an unbroken chain with many who are dead - his ancestors - and many who are living - lineal and collateral kin, that is, his family, and he is their property."[1/]

A Ghanaian upon his death is succeeded by his family. The line of succession is either matrilineal or patrilineal, the farmer more common in the forest zone and southern Ghana, the latter predominant in northern Ghana and the savanna zone. Land is owned by the community which allocates use rights to its families. An individual is allocated use rights to land by the

1/ N.A. Ollennu, "Aspects of Land Tenure" in A Study of Contemporary Ghana, Volume II, 1967.

family decision-maker. In a patrilineal society a deceased's use rights will be given to his/her children; in a matrilineal society these rights are given to the children of his/her sisters all of whom generally have a greater number of children than the deceased. Fragmentation, therefore, is likely to be more pronounced in areas cultivated by matrilineal societies.

According to one observer, the basic economic requirement of a well functioning tenure system is that the fertility of land be maintained.[2/] Since the responsibility felt by the community is less than that of an individual, LaAnyane argues, the communal system does not provide incentives toward conservation. We can, however, only speculate whether cultivation and land use practices would be more consistent with on-farm conservation requirements under alternative farms of tenure such as freeholds. On-farm conservation techniques such as mulching, ridging, contour plowing as well as the application of improved inputs, generally bring about annual increments to production, the benefits of which the cultivator obtains whether under communal tenure or freehold. There should, therefore, be little difference on individuals incentives to make annual improvements unless, of course, the accumulated deteriorated condition of the soil renders annual investments in such improvements unprofitable. With respect to investments in permanent improvements such as wells, irrigation systems, etc. an individual may have less incentives under communal tenure than under freehold. However, since land use rights are generally secure over an individual's lifetime, fragmentation of holdings rather than communal tenure

2/ S. LaAnyane in Ghana Journal of Sociology Vol.6,No.2.

tenure *per se* reduces incentives to investments in permanent improvements in so far as these incentives are determined by economies of holding size. Usufructuary rights vary considerably throughout Ghana. They may be perpetually alineable or saleable. Usufructuary rights may be transferred for certain periods, inherited, or may be granted for the life of the holder only.[5/]

2. Adjustments Taking Place.

A more important requirement of tenure is whether or not land-holding patterns are responsive to new demands and pressures which inevitably derive from commercialisation and agricultural transformation. A recent survey shows that 43 % of holdings sampled reported freehold tenure, 6 % leasehold and 49 % communal tenure.

There is a marked correlation between degree of commercialisation and proportion of holdings reporting freehold tenure by region. For example, in the Eastern, Ashanti and Central regions where cocoa is the major cash crop the proportion of samples reporting freehold are 73 %, 66 % and 56 % respectively. At the other extreme the proportion reporting communal tenure in the Upper, Western and Northern regions, where the opportunities for cocoa and commercial food production have historically been less favorable, were 73 %, 83 % and 100 % respectively. Furthermore, for the major cocoa areas LaAnyane[6/] reported a tendency to change matrilineal succession to patrilineal succession to assure tha t the long-term benefits of permanent improvements

5/ Ollennu, *op cit.*

6/ Agriculture and Land Use in Ghana.

(such as trees) are passed to the heirs of the deceased. This process has, however, given rise to a great deal of litigation and boundary disputes among the affected heirs with the result that much time and money is spent in courts rather than on the holdings.

Leasehold tenure is most prevalent in the Ashanti, Central, Volta and Eastern Regions and the demand for tenancy appears to vary directly with the value of land. The same survey reported no leaseholds in the Northern and Upper Regions, However, leasehold arrangements are becoming common in the rice-growing areas of the Northern Region. For example, migrants from the non-cocoa areas who could not afford a lumpsum payment to acquire rights to cocoa land, tenancy was the only alternative. There are two major forms of tenancy, abusa and abunu. Under both forms there are no written agreements and payment is made by allowing the absentee landlord a share in the produce of land. Under the abusa system this share is 33 % whereas under the abunu system, the produce is shared equally. Ollennu reports that the tenants security to the land "is as that of the purchaser of the possessory title" [7/] ; however, the tenant cannot alienate the land without consent of the landlord who must be given right of first refusal. Both tenancy systems vary with respect to the definition of produce. Generally, this refers only to cocoa or other cash crops, leaving the tenant the foodstuffs produced for subsistance.

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7/ IBID

Under both systems the tenant must pay all development costs and, more important, the landlord does not share in annual incremental production costs incurred by the purchase of, say, fertilizer, implements or chemicals. Therefore, the tenant has less incentive than under a freehold arrangement to risk time and money on improved methods and inputs, since the incremental output will be shared with absentee landlord.

3. Adaptiveness of the Present System.

In the above mentioned survey the majority of farmers sampled mentioned that the availability of land was not an important constraint to increasing agricultural production; rather, they more frequently mentioned lack of finance, family and hired labor and implements as more important constraints. However, this is not to say that it is easy for persons not owning land to acquire land for cultivation, particularly large tracts for mechanised or irrigated farming, in areas other than the land of their families. Even if it were true that farming on large-scale holdings is more efficient (optimum output per unit of land and per unit of time) than farming on small-scale holdings, it is likely to be less true from a social-economic point of view. Consequently with increased population pressures and increasing demand for the cultivation of fertile land by "strangers", the communal tenure system may be seen as a buffer in assuring that land use rights are allocated equitably in general and primarily to village or community members in particular.

That such pressures have come into play is evidenced by GOG's frequent exhortation of local chiefs to relinquish their under-or unutilised lands to people who are capable of using them.[9]

The Krobo people in the Eastern Region, in areas where cultivation requires large tracts of land the communal tenure system has evolved a system of agricultural companies called huga. Groups of farmers, not necessarily linked by lineage or kinship, acquire ownership in such parcels or large contiguous tracts (jugba) in proportion to their financial contribution. Although members of the huga own individual parcels, they make community decisions with regard to the use of the entire land.

In summary, since there is no customary law limiting an individual's right to own land or hold it, the traditional land tenure adjustments are potentially adaptive to changes required by agricultural transformation particularly in so far as such transformation implies a broad-based strategy of increasing agricultural production by present users of the land.

However, as will be explained in later chapters, the distribution of holdings and the distribution of total land area cultivated by size of holdings are quite skewed. For example in 1970, 82 % of the total number of holders cultivated an area of 10 acres or less. On the other hand, 57 % of the total land area is cultivated by holdings cultivating an area of 10 acres or

9/ Inter alia Col. Bernasko, Commissioner of the Ministry of Agriculture in Ghana Business Weekly, Nov. 3, 1974.

more, and 26 % of the total land area is cultivated by holdings having 30 acres or more. Leaving aside the question of definition of small-scale holding, it appears that the distribution of total land area cultivated is skewed in the direction of relatively large-scale holdings. We are, at this stage, not able to determine the extent to which land tenure conditions in Ghana explain the skewed distribution of total land area cultivated. We suspect that the use and availability of capital intensive technologies are an important explanatory variable of the skewness.

C. Human Resources.

As is shown in a later chapter each family laborer working full or part-time on the family holding, on a national average, works about 1.3 acres. For the vast majority of agricultural holders the only capital inputs are home produced in the form of seed stored from the previous year and some home-made handtools. Off-farm purchased capital inputs generally include hand-hoes and cutlasses. A much smaller proportion of Ghana's smallholders purchase improved seed and fertilizer although the proportion is increasing. Thus, the factor endowments in smallholder agriculture (the general case in Ghana) are predominantly land and labor.

1. The Supply of Agricultural Labor.

The supply of agricultural labor is primarily related to the size of the rural population and its rate of growth, sex and age distribution and the rate of net out-migration to the urban areas. The latter, in turn, effects over time the size of the rural population, the sex and age distribution and, therefore, the rate of growth. Migration is, therefore, an important determinant of the supply of agricultural labor. In areas of high rates of net out-migration of agricultural labor such as parts of the Upper, Northern and Volta Regions where migrants have historically departed either permanently or seasonally to the richer cocoa growing

areas in the forest zone, resulting labor scarcities have been observed during periods of seasonal peak demands for labor notably for land clearing, weeding and harvesting.

Without national statistics on the magnitude of rural out-migration it is difficult to determine the actual size of the agricultural labor force, its regional distribution on a seasonal basis and the trends over time.

Further, there is a problem of definition and, therefore a problem of measurement. From the Population Census data the size of the agricultural labor force can be inferred from the total labor force (population aged 15 and over) and the proportion of total population residing in rural areas (villages less than 5,000 people). This has been done in Table 13 which also shows the regional distribution of the rural labor force (as opposed to the agricultural labor force) and its changes over the 1960 - 1970 Census years. For 1970, the rural labor force has been estimated to be 3.23 million. It should be noted that during the 1960-70 decade Population Census data show that the total population has increased by 2.42 % per year. This underestimates the true rate of increase because the size of Ghana's population was affected by the implementation of the Aliens Compliance Order in November 1969, four months before Census night. Table 13 shows that the rural sectors' share of the total population has decreased from 77 % in 1960 to 71 % in 1970.

TABLE 13 ESTIMATION OF THE RURAL LABOR FORCE BY REGION AND CHANGES BETWEEN 1960-1970

| Region | Total Labor Force 1960 | Total Labor Force 1970 | Proportion of Total Population in Rural Areas 1960 | Proportion of Total Population in Rural Areas 1970 | Implied Rural Labor Force 1960 | Implied Rural Labor Force 1970 | Distribution of Rural Labor Force 1960 | Distribution of Rural Labor Force 1970 |
|---|---|---|---|---|---|---|---|---|
| | 000's | | % | | 000's | | % | |
| Western and Central | 765.3 | 885.6 | 74 | 73 | 566.3 | 646.5 | 20 | 20 |
| Greater Accra | 298.2 | 494.4 | 20 | 12 | 59.6 | 59.3 | 02 | 02 |
| Eastern | 596.0 | 658.6 | 80 | 75 | 476.8 | 494.0 | 17 | 15 |
| Volta | 422.5 | 496.5 | 87 | 84 | 367.6 | 417.1 | 13 | 13 |
| Ashanti | 595.5 | 752.5 | 75 | 73 | 446.6 | 549.3 | 16 | 17 |
| Brong-Ahafo | 316.9 | 393.5 | 86 | 78 | 272.5 | 306.9 | 09 | 10 |
| Northern and Upper | 735.8 | 862.2 | 92 | 87 | 676.9 | 750.1 | 23 | 23 |
| All Regions | 3730.3 | 4543.3 | 77 | 71 | 2872.3 | 3225.7 | 100.0 | 100.0 |

Source: 1960 and 1970 Census

a. Rural Labor Force: All person 15 years old and over who are potentially economically active in agricultural and non-agricultural activities in the rural sector. Included in the rural sector are towns and villages up 5,000 inhabitants or less.

b. Agricultural Labor Force: Person 15 years and over in both rural and urban areas who could be potentially active in agricultural activities.

c. Farm Labor Force: Are those persons domiciled with agricultural holders who work full or part-time on the farm.

Over the same period the total rural population increased by 1.6 % per year and the total urban population increased by 4.8 % per year.

In Table 13 it is shown that the total labor force (defined as persons aged 15 and over) has increased by 2 % per annum over the period 1960 to 1970, and that the estimated rural labor force has increased by only 1.17 %. This may be explained by urbanisation and by a shift in the age structure of the rural population. The distribution of the rural labor force between administrative regions has remained stable over the 1960-70 period, although slight increases may be inferred for the Brong-Ahafo and Ashanti regions, where the growth of the rural population was highest; and, a slight decrease for the Eastern region, where the growth of the rural population was smallest.

However, these figures give an incomplete view of the agricultural labor force. The farm sector can potentially draw its labor requirements from both the urban and rural labor force on either a temporary or permanent basis. The potential of drawing agricultural labor from the urban unemployed of course increases with the number of persons seeking urban employment who are unable to find wage employment. Unfortunately it is not possible to estimate and measure the potential agricultural labor force by this broader definition.

A more concise definition of the actual agricultural labor force, may be obtained from the population domiciled on agricultural holdings. The 1970 sample Census of Agriculture estimates this to have been 4.5 million persons of which 50 % were reported to be in the working age group of 16 - 49. Of these 60 % were females.[1/] The age distribution does not vary significantly on a regional basis except that larger proportions of the farm population were aged 16 and over in the Northern and Upper Regions.

Little information is available on rural, seasonal un-and under-employment on a basis which would delineate overall regional patterns and variations with respect to the supply and demand for agricultural labor.

There are several studies on rural-urban migration in Ghana. Caldwell[2/] has identified the major determinants; he found that the propensity to migrant increases :

a) the closer the rural village is to a large town;

b) the smaller the rural center;

c) the poorer the condtion in the rural center;

d) the existence of relatives in urban areas;

e) being male and a young adult;

1/ In a later section of this report there is a discussion on the role of women in agriculture.

2/ J.C. Caldwell. "Determinants of Rural-Urban Migration in Ghana." Population Studies, Vol.XXII, No.3, 1968.

f) the more education the potential migrant has;

g) the larger the family;

h) being nonfarm but rural unemployed.

The above study found that the volume of inter-regional migration is greatest where the income differential is greatest between regions; namely, migrants move from poorer to richer areas.

2. The Utilisation of The Rural Labor Force.

The rural labor force, as well as the unemployed urban labor force, may be potentially utilised in agricultural activities, either on or off holdings, and in non-agricultural activities in both the rural and urban sectors. The most important non-agricultural activities in the rural sector are mining, quarrying, logging, hunting and fishing. Unfortunately, the lack of appropriate 1970 Census data prevent detailed analysis so that the following discussion, which is based primarily on 1960 data, will only yield a general picture of the utilisation of Ghana's rural labor force in agriculture and other activities.

The most difficult problem in determining the nature and magnitude of agricultural labor utilisation from Population Census data has to do with the definition and measurement of persons employed in agriculture. In the context of the Census "agriculture comprises the industrial branches of agriculture, hunting, forestry, logging and fishing." The Census did not include in the agricultural labor force family labor working on agricultural holdings. Also, persons who were employed were those who worked for pay or profit during four weeks preceding Census night.

These definitions imply that persons reported as employed in agriculture (including, forestry, logging, fishing, hunting and livestock) were primarily employed off-farms or as wage employees (permanent or seasonal) on agricultural holdings. The table below gives the regional distribution of those reporting as employed in agriculture[1/] in 1960 and 1970.

TABLE 14: REGIONAL DISTRIBUTION OF EMPLOYMENT IN AGRICULTURE

| Region | Employed in Agriculture 1960 000's | % | 1970 000's | % | Employed in agriculture as a proportion to total employed in all industries % 1960 | 1970 |
|---|---|---|---|---|---|---|
| Western & Central | 333.5 | 21 | 398.7 | 22 | 58 | 60 |
| Greater Accra | 25.0 | 02 | 31.7 | 02 | 13 | 10 |
| Eastern | 260.8 | 17 | 268.6 | 15 | 59 | 57 |
| Volta | 192.6 | 12 | 218.9 | 12 | 62 | 60 |
| Ashanti | 275.0 | 17 | 317.9 | 18 | 62 | 58 |
| Brong-Ahafo | 174.1 | 11 | 233.5 | 13 | 81 | 77 |
| Northern & Upper | 320.3 | 20 | 321.4 | 18 | 86 | 71 |
| All Regions | 1581.3 | 100 | 1790.7 | 100 | 62 | 57 |

The annual increase in the number employed in agriculture was 1.25 %, less than the rate of growth of the rural population (1.6 %/yr.). Perhaps due to the larger proportion of rural persons in the 0-15 age groups, this increase was larger than the rate of growth in the estimated rural labor force (1.17 %/yr.)

1/ Supplemental enquiries to the 1960 Census include non-paid family workers among the economically active in agriculture. Such enquiries are not available for 1970.

The regional distribution of the total number employed in agriculture is similar to the regional distribution of the rural labor force in both 1960 and 1970.

The proportion of persons employed in agriculture to total employed in all industries decreased from 62% to 57 % over the 1960-70 period; the largest declines in these proportions were recorded for the Northern and Upper, Ashanti and Brong-Ahafo regions. However, over this same period the absolute total population employed in agriculture increased from 1.5 to 1.8 million.

Of the total employed in agriculture in 1960 (comparative data for 1970 is not yet available) 93 % were employed in the rural areas, 36 % were female and 58 % were employed in the production of foodstuffs and field crops. Cocoa engaged 33 % of the total employed in agriculture. The remaining 9 % were engaged in fishery (55,000), logging and forestry (24,000), and livestock (2,200 mainly in urban areas).

In the forest zone, the proportion of females engaged in agricultural employment was 44 %, considerably larger than the proportion of females engaged in agriculture (22%) in the savanna zone. This was due to the fact that females in the forest zone outnumber the males by 1.7 to 1 in the production of foodstuffs and field crops; males, however, outnumber females 2.5 to 1 in the production of cocoa, the crop reputed to have liberated the male in Ghanaian matrilineal society.

In all industries other than agriculture, 49 % were employed in the rural areas in 1960. Non-agricultural employment, therefore, accounted for 25 % of total employment in the rural areas which was 1.96 million in 1960 or about 68 % of the estimated rural labor force. This implies that about 91,000 people in the rural areas were either unemployed or occupied in non-wage earning or non-profit-making activities on their households or holdings; 530,000 are estimated to have been rural home makers (98 % females); 246,00 (61 % male) voluntarily unemployed, transfer recipients or disabled; and, the remainder 134,000 or 5 % of the total rural labor force are estimated to have been unemployed in 1960.

The most important non-agricultural activities for rural employment were manufacturing (146,000), commerce (183,000), services (62,600), mining (29,700), and transport and storage (28,200). Females generally dominated commerce, (i.e. wholesale, retail and petty trading) explaining about 75 % of the total employed; females also accounted for 42 % of the total employed in rural manufacturing.

The following characteristics of labor utilisation can be obtained from 1970 population census data available so far. The rural labor force is estimated to have been 3.2 million; total employment, rural and urban, was 3.13 million and increased by 2.04 %/yr. over the 1960-70 period. The largest annual increase in total employment was recorded for females (3.62 %) and their proportion of total employed increased from 39 % in 1960 to 45 % in 1970; the largest increases were recorded in

the Northern, Upper and Brong-Ahafo regions. The annual increase in the total number of males employed was only 0.92 % per year during the decade. Further study will be necessary to determine the causes either real or statistical underlying these differences.[1/]

The total number of home-makers decreased from 688,100 in 1960 to 625,400 in 1970, decreasing very slightly in the Northern Region and more significantly in the Western and Central, Eastern, Volta and Brong-Ahafo regions.

The total number employed in agriculture increased from 1.58 million in 1960 to 1.79 in 1970 or by 1.26 % per year - less than the increase in total employment. The greatest part of this increase (92 %) was explained by an increase in the number of females employed in agriculture. The largest increase in females employed in agriculture was recorded for the Western, Central, Ashanti and Brong-Ahafo Regions. We can only speculate as to the causes underlying these trends, though it is likely that the Aliens Compliance Order, and the increased demand for foodstuffs may have been important explanatory variables.

3. Labor Utilisation on Holdings.

It is not possible to distinguish between permanent and part-time or seasonally employed labor in the rural sector from available population census data. The failure to make this distinction may give a misleading picture of the proportion of time spent by the rural labor

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1/ This may have been affected by the Aliens Compliance Order as the sex ratio was changed from 0.98 in 1960 to 1.01 in 1970.

force in activities on the holding and in wage earning activities off the holding. Life in rural Ghana, in contrast to the inferences made from the Population Census, is primarily centered on the holding. The total amount of time spent in activities off the holding, particularly for those residing on the holding and not attending school, may largely be determined by labor requirements on the holding. Unfortunately, little work has been done to determine labor requirements on the holding and the allocation of labor time between activities on and off the holding. However, it has been estimated in the 1970 Agricultural Census that 20 % of the holders have occupations in addition to farming. Yet, in a 1969 national sample survey by the Economics and Marketing Division of the Ministry of Agriculture the lack of family labor and finance to hire labor was mentioned most frequently as the most important constraint to bringing greater land area under cultivation. This lack of labor was most pronounced in the Ashanti, Eastern, Central and Volta regions, i.e. the forest-zone, the same regions where the number of holders reporting employment in addition to farming was highest. Much more study is necessary to determine relative rates of utilisation of and returns to labor in competing activities on the holding or off the holding to derive at judgments about the relation between the supply and demand for agricultural labor.

On the basis of Agricultural Sample Census data the following table illustrates the degree and nature of labor utilisation (provided by family members of holders households) on Ghana's holdings by regions.

TABLE 15 LABOR UTILISATION OF HOUSEHOLD MEMBERS ON HOLDINGS BY REGIONS

| Region | Full-time 000's | Full-time % | Part-time 000's | Part-time % | Not at all 000's | Not at all % | Total Household Members 000's | % Share of Total Rural Population |
|---|---|---|---|---|---|---|---|---|
| Western | 130 | 35 | 108 | 29 | 132 | 36 | 370 | 65 |
| Central | 148 | 36 | 134 | 33 | 125 | 31 | 407 | 63 |
| Eastern | 194 | 27 | 303 | 42 | 216 | 31 | 713 | 68 |
| Volta | 120 | 21 | 217 | 39 | 224 | 40 | 561 | 71 |
| Ashanti | 215 | 27 | 332 | 41 | 259 | 32 | 806 | 75 |
| Brong-Ahafo | 138 | 37 | 145 | 34 | 143 | 29 | 426 | 71 |
| Northern | 161 | 44 | 135 | 31 | 138 | 25 | 434 | 75 |
| Upper | 255 | 32 | 272 | 34 | 275 | 44 | 802 | 99 |
| Total | 1,362 | 30 | 1645 | 36.5 | 1510 | 33.5 | 4517 | 74 |

Table 15 shows that 4.5 million or 53 % of Ghana's total population and 74 % of the country's rural population live on agricultural holdings. The non-farm rural population was therefore about 1.35 million in 1970. About 3.0 million persons, excluding hired labor, cultivated agricultural holdings on a full-or part-time basis. This implies in a rough manner that each family farm worker (with the assistance of part-time communal or hired labor) produced agricultural products for himself and 8.85 other Ghanaians.

Part-time, on-farm work by family members is most pronounced in the Eastern, Volta, Ashanti and Brong-Ahafo Regions implying the use of hired labor or significant off-farm employment. The use of on-farm hired labor is illustrated in Table 16.

TABLE 16 EMPLOYMENT OF HIRED LABOR ON AGRICULTURE HOLDINGS, 1970/71

| Region | Daily Wage Rate ¢ | Permanent 000's | Temporary 000's | Total | Total Hired as A Proportion Full-time Family labor |
|---|---|---|---|---|---|
| Western | .70 | 15.4 | 25.6 | 41.0 | .32 |
| Central | .70 | 15.0 | 10.5 | 35.5 | .24 |
| Eastern | .75 | 50.3 | 61.7 | 112.0 | .58 |
| Volta | .80 | 21.5 | 32.5 | 54.0 | .45 |
| Ashanti | .70 | 75.7 | 63.8 | 139.5 | .65 |
| Brong-Ahafo | .70 | 34.3 | 51.6 | 85.9 | .62 |
| Northern | .65 | 2.9 | 11.6 | 14.5 | .09 |
| Upper | .55 | 1.5 | 27.2 | 28.7 | .11 |
| Total .. | | 216.6 | 284.5 | 501.1 | .37 |

Fourteen percent of Ghana's total agricultural farm labor force is made up of hired labor on a permanent or temporary basis. The use of hired labor in proportion to full-time family labor, is greatest in the Eastern, Volta, Ashanti and Brong-Ahafo regions where daily wage rates (including payments in kind such as meals) are highest. According to the 1970 Agricultural Census, the use of hired labor is most frequent on holdings producing mainly for sale (i.e. selling more than 50 % of produce) and on holdings cultivating 10 acres or more. Only 26 % of holdings producing for subsistence only use hired labor.[1/]

1/ Of all holdings, 14 % produce for subsistence only (mainly in Upper and Northern Regions), 36 % mainly subsistence (selling less than 50 % of product) and 50 % produce mainly for sale.

The tendency for farmers themselves to be engaged in off-farm employment is greatest for those producing for subsistence only. These farmers are located primarily in the Eastern (65 %), Volta (65 %) and Western (50 %) Regions. It is probably necessary for these holders to supplement their household subsistence by temporary wage employment on larger holdings or in non-agricultural employment to obtain cash for supplemental food, cloth, tools, etc.

The extent to which a shortage of farm labor is likely to be a constraint to increasing agricultural production may be discerned from the age distribution of holders and household members. According to the 1970 Agriculture Sample Census only 10 % of all holders were under 30 and 39 % were 50 or over. Fifty percent of the family members in holder's households were below 16 (26 % male and 24 % female), 10 % above 50 years, and only 22 % between 16 - 30 years old. About 40 % of the agricultural population in 1970 was of productive age; namely, between the ages of 16 and 49. Of this age group, 60 % were females. It is important to note that these farm workers (which largely operate small holdings less than 5 acres) must support themselves and the remaining 60 percent of the farm population before marketable surpluses are generated for release to non-farm consumers.

D. Production Units.

In 1970 there was an estimated 8.6 million people in Ghana of which 4.5 million were living in agricultural households. It was estimated there were 805,200 agricultural holders (excluding hunting and fishing) with an average family size of 5.6 persons.

The farm population of 4.5 million people, or about 52 percent of the total population, is an aggregate of the "consumption units" domiciled in agriculture. However, the "production units"—persons actually engaged full or part-time in agricultural activities—is less owing to age (small children and the elderly) and off-farm activities.

1. Total Holders (Holdings).

In the Ghanaian context a holder (farmer) operates a holding (farm) which is generally made up of several farms (plots or fields) which are often non-contiguous. In the sample Census of Agriculture grazing land and idle plots (e.g., plots in fallow) are not included in the definition of a holding.

Table 17 shows the estimated number of holders (and holdings) in agriculture on a regional and national basis.

TABLE 17 TOTAL NUMBER OF HOLDINGS IN AGRICULTURE, 1970-73
(000's OF HOLDINGS)

| Region | 1970 | 1973 | % Change |
|---|---|---|---|
| Western | 68.1 | 76.5 | 12 |
| Central | 881.1 | 88.1 | 9 |
| Eastern | 148.2 | 181.7 | 23 |
| Volta | 108.6 | 115.5 | 6 |
| Ashanti | 147.7 | 146.4 | -1 |
| Brong-Ahafo | 71.6 | 83.7 | 17 |
| Northern | 61.2 | 59.8 | -2 |
| Upper | 118.7 | 106.0 | -11 |
| Ghana | 805.2 | 857.7 | 7 |

Source: Adapted from 1970 Sample Census of Agriculture and Current Agricultural Statistics (1973).

Several significant factors are illustrated in the above table. There has been a 7 percent increase in the number of holders over the four-year period 1970 to 1973. Assuming the 1970 and 1973 estimates are accurate, one would enquire as to the source of this increase. While it is possible that some new people have taken up farming it is not assumed that the increase can be explained by a back-migration to agriculture. It is more likely that given the age distribution of males in agriculture, many farmers' sons have taken their own holdings during this period. In many cases these "new holders" probably operated part of the fathers' original holding.

Another important feature of Table___ is that in 1970 and 1973 about 65 percent of the total holders (and holdings) were located in four regions: Eastern, Volta, Ashanti and Upper. In 1973, 52 percent of the holdings were in three southern regions. These were in declining order the Eastern, Ashanti and Volta Regions. The Upper Region ranked 4th on total number of holders.

The regions with the major increase in the number of holdings were the Eastern (23 percent), Brong-Ahafo (17 percent) and Western (12 percent). There was a significant decline in the number of holders in the Upper Region (11 percent). While it is not known why this decline occurred it might be assumed that several forces have been important. These would include the relatively high population density in the Upper Region, a poor rainfall pattern over the recent past, and the historical seasonal migration of agricultural labor from the Upper Region to Southern cocoa producing areas.

2. Total Number of Farms.

It will be recalled that a holding generally consists of several, often non-contiguous fields or plots. These are referred to as "farms" in the Ghanaian context.

Over the four-year period, 1970 to 1973 the total number of farms have increased from 2.2 to 2.4 million or by about 9 %. With the exception of the Ashanti Region which recorded a 6 % decline, in all regions farm numbers increased. The most significant increase in farm numbers was in the Western Region (29 %) where the number of holders also increased by about 12 % over this period.

On a national basis the average number of acres per holder is 2.8 and has not changed significantly over the period 1970-73. However, between 1963 and 1973 the number of farms per holder increased from 2.3 to 2.8 or by about 22 percent.

3. Distribution of Size of Holding.

Table 18 describes the distribution of holding size in Ghanaian agriculture. It can be seen from this table that 55 percent of the holdings are less than 4 acres, 82 percent are less than 10 acres, and only about 11 percent of the holdings are 15 acres or more. It should be noted that generally a holding consists of several often noncontiguous fields.

Ghanaian agriculture on the basis of production units can be described as small-scale agriculture. The distribution of the size of holdings has major policy implications for choice of strategies to foster agricultural development and these are discussed in the latter chapters of this report.

TABLE 18: DISTRIBUTION OF SIZE OF HOLDING AND THE NUMBER OF HOLDINGS RELATIVE TO CULTIVATED AREA

| Size of Holding (Acres) | Cumulative Percentage of Farms | Cumulative % of Land Area |
|---|---|---|
| 0 - 1.9 | 31 | 4 |
| 2.0 - 3.9 | 55 | 10 |
| 4.0 - 5.9 | 68 | 18 |
| 6.0 - 7.9 | 77 | 26 |
| 8.0 - 9.9 | 82 | 32 |
| 10.0 - 14.9 | 89 | 43 |
| 15.0 - 19.9 | 93 | 52 |
| 20.0 - 29.9 | 96 | 63 |
| 30.0 - 49.9 | 98 | 74 |
| 50.0 or more | 100 | 100 |

Source: Adapted from the Ghana Sample Census of Agriculture 1970.

4. Holders Relative to Cultivated Area.

Looking at the distribution of the size of holding in isolation of the number of holders relative to cultivated area is misleading. Table 18 also shows for each holding-size category the percentage of total cultivated land area in each category.

The table shows that while 55 percent of the holdings are less than 4 acres only 14 percent of the total cultivated area is represented by these farms. Or, while 82 percent of the holdings are less than 10 acres only about a third of the total cultivated land

is represented by these small holdings. On the other hand, while only 2 percent of the holdings are 30 acres or more, 26 percent of the total cultivated land is represented by this group.

It should be pointed out that total cultivated land includes estates and plantations. It should be stressed, however, that for the major food crops in the agricultural economy the smallholders account for a greater share of the total acreage of these crops than do farms of 15 acres and above.

E. Relative Importance of Private and Public Production Units.

Mainly during the decade of the 1960s large-scale, relatively capital intensive public production units were believed to be the major hope to increasing agricultural production in Ghana. The major reasons for this thrust was the belief that the small-scale private sector was not and could not increase production at a rate required for export, domestic industry and the increasing food requirements of a growing population and national income. Despite the emphasis given to this approach, large-scale public production units are relatively unimportant in terms of their contribution to national output as is described below.

1. In Terms of Output.

In terms of the output of the major food crops, public production units contributed a meager 2 percent of the total output of cereals and less than one

percent of the national output of root crops, plantain and groundnuts.

In terms of the total domestic acreage of these major food crops, public institutions accounted for only 1.2 percent of the national cereal acreage and less than 1.0 percent of the acres devoted to the other food crops.

3. In Terms of Number of Units.

In 1973, as shown below by Table 19, there were 92 public production units engaged in agricultural production and 857 thousand small-scale private production units. Namely, only about one percent of the agricultural production units in Ghana are accounted for by the public units.

TABLE 19: NUMBER OF PUBLIC AND PRIVATE PRODUCTION UNITS, 1973

| Description | Number of Units | Smallholders |
|---|---|---|
| Public | | |
| State 1/ | 5 | |
| Institutions 2/ | 30 | |
| Company 3/ | 57 | |
| Total .. | 92 | 857,700 |

Source: MOA Current Agricultural Statistics, 1973.

1/ Includes State Farms and The Food Production Corporation

2/ Includes School and Prison Farms

3/ Public Companies who are responsible for land and crop development on private farms and who purchase the bulk of the output of these farms.

5. Measures of Relative Productivity.

Table 20 below shows that in terms of selected non-capital, physical input/output relationships the private smallholder is much more productive than the State Farms Corporation.

According to this source the small-scale sector utilises 45 percent less land per worker, and obtains 82 percent greater yield per acre and 73 percent more production per worker.

TABLE 20: SELECTED MEASURES OF PRODUCTIVITY FOR STATE FARMS AND THE TRADITIONAL SECTOR

| Features | Traditional Sector | State Farms Corporation |
|---|---|---|
| Number of Workers | 1,600,000 | 18,000 |
| Acres cultivated | 3,000,000 | 49,000 |
| Output (long tons) | 3,500,000 | 10,000 |
| Acres per worker | 1.87 | 2.72 |
| Yield (tons/acre) | 1.17 | 0.21 |
| Production per worker(tons) | 2.18 | 0.59 |

Source: Marvin P. Miracle and Ann Seidman. "State Farms In Ghana." Mimeo. March, 1973.

While the figures are not readily available it is generally known that the State Farms Corporation has required very high capital and recurrent expenditures from the National Budget. On the other hand, the quantity and value of capital utilized by

the smallholders is extremely low. If the figures were available they would show that the capital requirements per acre and per unit of output would be meager for the smallholder sector, but astronomical for the State Farms.

Not only is capital expenditure per unit of output (or per unit of land) very high for public production units, but these firms are generally not able to cover their annual operating costs. Table 21 below shows that all of the Food Production Corporation Farms in the Eastern Region were, in 1971, operating at a loss. With the exception of one farm (Nyafoman) the annual gross receipts of these farms did not even cover the salary and wage payments for one month.

TABLE 21: INDICATORS OF FINANCIAL LOSSES AT EIGHT FOOD PRODUCTION CORP. FARMS IN THE EASTERN REGION, 1971

| Farm | Gross Sales (N¢) (June 1970-July, 1971) | Salaries and Wages (June 1971 only) |
|---|---|---|
| New Tafo | N¢ 1,943 | N¢ 2,082 |
| Kanko | 1,408 | 2,111 |
| Akuse | closed | 2,155 |
| Nyafoman | 3,187 | 1,956 |
| Koforidua | 1,637 | 2,429 |
| Abenasi | 605 | 2,310 |
| Kwahu Tafo | N.A. | 7,046 |
| Somanya | N.A. | 1,383 |

Source: West Africa (July 23, 1973)

## F. National Importance of Selected Crops.

### 1. Introduction.

The 1970 Ghana Sample Census of Agriculture classifies crops on the basis of (1) main cash crops, (2) other tree crops, (3) cereals, (4) root crops, and (5) pulses and nuts, and (6) fruits and vegetables.

Table 22 shows the relative importance of each classification, both in terms of acres and the relative contribution (value) of each crop (and classification) to total agricultural production.

In terms of acres, the crop classifications in decreasing order of importance are Main Cash Crops which are predominantly cocoa (56 %) and Cereals (24 %); Root Crops (11 %), Other Tree Crops which are predominately plantain (6 %), and Pulses and Nuts (3 %).

Probably a more illustrative classification scheme and certainly one more useful for this assessment is given as Table 23. This table lists the nine most important food crops in agriculture and the Ghanaian diet, plus cocoa the dominant crop in Ghanaian economy.

The nine major food crops in 1970, contributed 51 percent of the total value of agricultural production and account for 41% of the cultivated acreage. In value terms, four crops (plantain, cocoyam, yam, and cassava) contributed nearly 40 percent of the

TABLE 22: THE RELATIVE IMPORTANCE OF MAJOR CROPS IN GHANAIAN AGRICULTURE ON THE BASIS OF ACREAGE AND VALUE, 1970

| | Acres 1/ | % of Total Acres | % of Total Value of Agricultural Production |
|---|---|---|---|
| **Main Cash Crops:** | | | |
| Cocoa | 3,478 | 55.0 | 34.6 |
| Coffee | 56 | 1.0 | 0.3 |
| Kola | 1 | Neg. | Neg. |
| Sugar cane | 6 | 0.1 | 0.1 |
| Sub-total | 3,541 | 56.1 | 35.0 |
| **Other tree crops:** | | | |
| Coconut | 75 | 1.2 | Neg. |
| Palm fruits | 44 | 0.7 | 0.5 |
| Plantain | 187 | 3.0 | 13.3 |
| Citrus | 59 | 0.9 | 0.2 |
| Sub-total | 365 | 5.8 | 14.0 |
| **Cereals:** 2/ | | | |
| Maize | 714 | 11.3 | 3.5 |
| Rice | 136 | 2.1 | 1.4 |
| Millet | 379 | 6.0 | 2.0 |
| Sorghum | 277 | 4.4 | 2.7 |
| Sub-total | 1,506 | 23.8 | 9.6 |
| **Root Crops:** 2/ | | | |
| Cassava | 312 | 4.9 | 8.4 |
| Yam | 292 | 4.6 | 8.4 |
| Cocoyam | 97 | 1.5 | 8.9 |
| Sub-total | 701 | 11.0 | 25.7 |
| **Pulses and Nuts:** | | | |
| Groundnuts | 177 | 2.8 | 2.2 |
| Beans/Cowpeas | 7 | 0.1 | 0.5 |
| Sub-total | 184 | 2.9 | 2.7 |

TABLE 22: (CONTD.)

| | Acres | % of Total Acres | % of Total Value of Agricultural Production |
|---|---|---|---|
| Vegetables: 2/ | | | |
| Pepper, dried | 9 | 0.1 | 1.6 |
| Tomato | 10 | 0.2 | 0.8 |
| Okro | 4 | 0.1 | 1.2 |
| Sub-total | 23 | 0.4 | 2.6 |
| Crop Total: | 6,320 | 100.0 | 89.6 |
| Other: | | | |
| Chicken (eggs) | | | 2.4 |
| Chicken (meat) | | | 1.8 |
| Pigs | | | 1.6 |
| Cattle | | | 0.9 |
| Goats | | | 0.4 |
| Sheep | | | 0.3 |
| Guinea fowl | | | 0.4 |
| Other | | | 2.6 |
| Sub-total | | | 10.4 |
| Total | .. | .. | 100.0 |

Source: Adapted from the 1970 Ghanaian Sample Census of Agriculture and B.E. Rourke, "Rural Employment and Labour Productivity in Ghana," mimeo. Legon, Ghana. March 1974.

N.B. 1/ Includes acreage as pure stand and mixed predominant but not acreage as mixed subsidiary.

2/ Includes main season crop only.

TABLE 23: RELATIVE IMPORTANCE OF NINE FOOD CROPS AND COCOA IN GHANAIAN AGRICULTURE, 1970

| | Percent Contribution to to Total Value Agricultural Production | Percent of Total Cultivated Acres 1/ |
|---|---|---|
| Plantain | 13.3 | 3.0 |
| Cocoyam | 8.9 | 1.5 |
| Yam | 8.4 | 4.6 |
| Cassava | 8.4 | 4.9 |
| Maize | 3.5 | 11.3 |
| Sorghum | 2.7 | 4.4 |
| Groundnuts | 2.2 | 2.8 |
| Millet | 2.0 | 6.0 |
| Rice | 1.4 | 2.1 |
| Sub-total | 50.8 | 40.6 |
| Cocoa | 34.6 | 55.0 |
| Total | 85.4 | 95.6 |

Source: Adapted from the 1970 Ghanaian Sample Census of Agriculture and B.I. Rourke, "Rural Employment and Labour Productivity in Ghana," mimeo. Legon, Ghana. March 1974.

1/ Based upon only main season crop acreage and pure stand and dominate crop mixtures but not subsidiary mixtures.

N.B. The relative importance of rice is under-stated in this table because of the large acreage expansion and increased yield which have occurred since 1970. Today, rice probably follows maize in relative importance.

total value of agricultural production. In terms of acreage the top ranking four crops (maize, millet, cassava, and yams) account for 27 percent of the total national cultivated acreage.

Table 23 in addition demonstrates the dominance and over reliance on cocoa in Ghanaian agriculture. As shown, cocoa contributes about 35 percent of the total value of agricultural production and accounts for 55 percent of the total cultivated acreage.

Together, based upon 1970 estimates, the nine food crops and cocoa account for 85 percent of the total value of agricultural production. These crops also accounted for 96 percent of the total cultivated acreage.

2. Crop Production and Acreage Estimates.

a) Maize

Holders. Maize is a major crop in the total agricultural economy of Ghana. The number of holders involved in maize production has increased annually between 1970 and 1973. The rate of increase in the number of holders producing maize during this period was about 38 percent. In 1973 there were approximately 571,000 maize holders or about 67 percent of the total number of holders in agriculture.

Acreage. Maize is typically grown in a mixed predominant or pure stand. On this basis the acreage devoted to maize has increased from 714,000 acres in 1970 to 746,000 acres in 1973 (or by about 5 percent) per year. There was a sharp decline in maize

acreage in 1972 but in 1973 the acreage increased by about 29 percent.

Production. Between 1971 and 1973 the national production of maize expanded annually and over the three-year period production increased by about 8 percent. The average annual rate of increase in production was 2.8 percent or about equal to the national population growth rate.

The increase in production over this period can apparently be explained by an increase in the number of holders producing maize, a slight increase in average farm size, and an aggregate increase in acreage between 1972 and 1973. Between 1972 and 1973, all regions of the country expanded maize acreage except the Western Region where acreage declined by about a fifth and in the Upper Region where acreage was constant.

Yield. The only available yield estimates are for 1971 and these are shown in Table 24 . It is likely that there has been an increase in maize yields owing to an increase in the availability of improved maize seed produced and sold by the Seed Multiplication Unit of the Ministry of Agriculture. Despite an increased availability of improved maize seed, the supply of improved seed has to date not been able to meet the prevailing demand. In addition to the increased use of improved seed, fertilizer use for maize has also increased and this has undoubtedly contributed to increased yields.

Concentration. Table 25 below shows that maize production in 1973 was concentrated in the Brong-Ahafo, Ashanti, Northern and

Eastern Region. These four regions accounted for 76 percent of total maize production, 66 percent of the national maize acreage and 60 percent of the maize producers.

TABLE 24: NATIONAL MAIZE PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 378 | 383 | 410 |
| ACRES 1/ (000's) | A. | 714 | 721 | 580 | 746 |
| | B. | 900 | 851 | 769 | 925 |
| HOLDERS (000's) | | 414 | NA | 517 | 571 |
| MEAN AREA (Per Holder) | | 2.2 | NA | 1.5 | 1.6 |

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Brong-Ahafo | 1,300 | 1,300 |
| Ashanti | 1,300 | 1,050 |
| Northern | 750 | 850 |
| Eastern | 800 | 1,000 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A: Pure stand and Mixed Predominant Stands.
B: Includes the acreage devoted to the crop in a subsidiary mixture.

TABLE 25: MAJOR MAIZE PRODUCING REGIONS, 1973

| Region | Production National % | Production National Rank | Acres[1/] National % | Acres[1/] National Rank | Holders National % | Holders National Rank |
|---|---|---|---|---|---|---|
| Brong-Ahafo | 19 | 1 | 15 | 4 | 11 | 5 |
| Ashanti | 17 | 2 | 18 | 1 | 19 | 2 |
| Northern | 16 | 3 | 16 | 3 | 9 | 6 |
| Eastern | 14 | 4 | 17 | 2 | 21 | 1 |
| Total | 76 | | 66 | | 60 | |

1/ Acres in terms of pure and mixed predominate stands only

Relative Importance. In 1970 the acreage devoted to maize was second only to cocoa, when maize accounted for about 11 percent of the total cultivated acres.

In the same year, maize ranked 6th (after cocoa, plantain, cocoyam, yam and cassava) in terms of its contribution to the value of total agricultural production (See Table 26 ).

b) Sorghum

Sorghum is known as guinea corn in Ghana. It is grown in four regions but is heavily concentrated in the Upper and Northern reggions.

Holders. The number of holders producing sorghum has declined steadily since 1970. Over this period the decline has been about 18 percent or approximately 4½ percent annually. It should be noted here that over this period the total number of holders in agriculture declined in the Upper (11 percent) and Northern (2 percent) regions. Since about 60

percent of holders producing sorghum are in the Upper Region, and about 70 percent of the holders in the Upper Region produce sorghum, a decline in the total number of holders in this area probably explains the decline in the number of holders producing this crop. Why there is an out-migration of holders in the Upper Region is discussed in a latter section of this report.

Acreage. Excluding the acreage estimate for 1971 which is highly suspect (very high relative to 1970 and 1972-73) there has been only a marginal change in the national acreage of this crop. While this is true if one looks at the acreage in terms of pure stand and mixed predominant stands, the acreage of sorghum in a mixed subsidiary stand has significantly increased in the Northern Region between 1972 and 1973.

TABLE_____NATIONAL SORGHUM PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 1970 | 149 | 164 |
| ACRES[1] (000's) | A. | 277 | 560 | 293 | 287 |
| | B. | 600 | 576 | 490 | 543 |
| HOLDERS (000's) | | 164 | NA | 159 | 134 |
| MEAN AREA (Per Holder) | | 3.7 | NA | 4.1 | 4.0 |

TABLE 26: (CONTD.)

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Upper | 550 | 700 |
| Northern | 750 | 650 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A: Pure Stand and Mixed Predominant Stands.
B. Includes the acreage devoted to the crop in a subsidiary mixture.

Production. The production of sorghum declined slightly over the three-year period 1971 to 1973. However, production increased by about 10 percent between 1972 and 1973. All of the increase in production between 1972 and 1973 was attributed to an increase in production in the Northern Region. Production remained virtually constant in the Upper Region over this period.

The increase in sorghum production between 1972 and 1973 can be largely explained by the expansion of acres in the Northern Region and to a lesser extent by a higher yield per acre for pure stand sorghum in that region.

The use of improved sorghum seed is very limited, however, the Seed Multiplication Unit of the Ministry of Agriculture and the Christian Service Committee in the Northern Region have conducted successful trials on dwarf sorghum. The Seed Multiplication Unit of the Ministry of Agriculture is now multiplying this improved seed which is in large demand particularly in the Northern Region.

**Concentration.** As Table 27 shows, 98 percent of sorghum production is concentrated in the Upper and Northern Regions. While the Upper Region accounts for about 63 percent of the total national production, a recent trend indicates that the production of this crop is expanding in the Northern Region. It is likely that the Upper Region will become relatively less important.

TABLE 27: MAJOR SORGHUM PRODUCING REGIONS, 1973

| Region | Production National % | Production National Rank | Acres 1/ National % | Acres 1/ National Rank | Holders National % | Holders National Rank |
|---|---|---|---|---|---|---|
| Upper | 63 | 1 | 78 | 1 | 57 | 1 |
| Northern | 35 | 2 | 21 | 2 | 40 | 2 |
| Total .. | 98 | | 99 | | 97 | |

1/ On the basis of pure and mixed predominant stands.

c) Finger Millet

Like sorghum, millet is almost exclusively produced in the Upper and Northern Regions.

**Holders.** Over the four-year period 1970 to 1973 there has been about a 4 percent increase in the number of holders producing millet. During this period there has been a steady decline in the number of holders producing millet in the Upper Region (18 percent decline) and a steady increase in the number of holders producing millet in the Northern Region (58 percent).

Acreage. There was a steady decrease in the national acreage of millet between 1970 and 1972. On the basis of pure and mixed predominant stands the decrease over the three-year period was about 45 percent or at an average annual rate of approximately 11 percent. However, between 1972 and 1973 the acreage of millet increased by about 6,000 acres or by 3 percent.

Production. The national production of millet declined by 19 percent between 1971 and 1972 but increased by 9 percent between 1972 and 1973. Between 1972 and 1973 the majority of the national production increase came from the Northern Region but to a much lesser extent production also increased in the Brong-Ahafo Region.

TABLE 28: NATIONAL MILLET PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 120 | 97 | 106 |
| ACRES 1/ (000's) | A. | 379 | 468 | 206 | 212 |
| | B. | 615 | 568 | 433 | 474 |
| HOLDERS (000's) | | 146 | NA | 141 | 152 |
| MEAN AREA (Per Holder) | | 4.2 | NA | 3.1 | 3.1 |

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Upper | 550 | 500 |
| Northern | 600 | 500 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A: Pure Stand and Mixed Predominant Stands.

B: Includes the acreage devoted to the crop in subsidiary mixture.

Yield. Yield estimates are only available for 1971 and are low (See Table 28 ). In the Northern Region the yield is about 600 lbs. per acre and in the Upper Region about 550 lbs. per acre for a pure stand crop. Traditional millet varieties are in common use.

Concentration. As Table 29 below shows, 70 percent of the total millet production is in the Upper Region and about 29 percent in the Northern Regions. These two regions account for 99%of acreage and 97 percent of the millet holders.

TABLE 29 MAJOR MILLET PRODUCING REGIONS, 1973

| Region | Production | | Acres 1/ | | Holders | |
|---|---|---|---|---|---|---|
| | National % | National Rank | National % | National Rank | National % | National Rank |
| Upper | 69 | 1 | 70 | 1 | 59 | 1 |
| Northern | 30 | 2 | 29 | 2 | 38 | 2 |
| Total .. | 99 | | 99 | | 97 | |

1/ Includes millet in a subsidiary crop mixture.

d) Rice

Rice like maize is a major crop in which the GOG has embarked on an import substitution campaign. The production of rice was given major emphasis by the Ministry of Agriculture in 1968 and the production of the crop has expanded since then, particularly in the Northern Region.

While estimates differ it is generally agreed by those closest to the rice industry that in the Northern Region acreage has expanded from about 36,000 acres in 1970 to about 80,000 acres in the current 1974 production year.

Holders. Over the period 1970 to 1973 the number of holders in all regions remained relatively constant except in 1973 the number of holders growing paddy in the Upper Region declined by approximately 21,000, a decline of about 55 percent. The number of holders producing paddy increased in the Ashanti (38 %), Brong-Ahafo (35 %) and Northern (11 %) Regions. However, on a national basis the number of holders producing rice declined by 32 percent.

Acreage. Over the four-year period 1970 to 1973 there has been a steady increase in the national acreage of paddy, increasing from 96,000 acres in 1970 to 126,000 acres in 1973 (on a pure stand basis).

Production. While production estimates for the sixties and early 1970s are not available on a comparable basis it is quite certain there has been a steady increase in the production of rice in Ghana since about the middle 1960s. While historically rice production predominated in the Volta Region, since the late 1960s the NorthernRegion has been the major producer.

In the Northern Region paddy is produced on the shallow saucer-shaped bottom lands (fadamas). The crop is rainfed on lands that have had little economic use. The production system is based upon mechanical plowing (50-60 hp tractors) and increasingly upon combine harvesting.

TABLE 30: NATIONAL RICE PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | NA | 51 | 63 |
| ACRES 1/ (000's) | A. | 96 | NA | 120 | 126 |
| | B. | 136 | NA | 149 | 174 |
| HOLDERS (000's) | | 60.8 | | 66.5 | 41.4 |

MAJOR REGION 1972 YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand |
|---|---|
| Upper | 900 |
| Northern | 700 |

Source: Adapted from the 1970 sample census of agriculture and current agricultural statistics reports.

1/ A : Pure stand.

B : Includes acreage devoted to the crop on a mixed predominant stand and a subsidiary mixture.

It has been estimated that about 90 percent of the total acres cultivated to rice have been mechanically plowed in the Northern Region.

The industry has been heavily favored. A very large proportion of the fertilizer used in Ghana has been allocated to the Northern Region and has been increasingly subsidized in recent years (see Section H of this chapter). In addition, a major effort of the Seed Multiplication Unit of the Ministry of Agriculture is located in the NorthernRegion and the Unit has done a commendable job multiplying large quantities of improved rice varieties. In addition, a relatively large number (400 ) of tractors and associated equipment, operated by private contractors, are available for hire for initial land preparation (plowing and harrowing). The charges are artificially cheap owing to an overvalued exchange rate which keeps capital costs for tractors, equipment and spare parts down.

In 1970, in the Northern Region, the mean size of rice farm was about 6 acres, but there are a large number of farms (400-500) which are 50 acres and above.

Yield. Owing to the availability of improved seed and fertilizer, and the gradual improvement in the standard of land preparation the average paddy yields have increased from about 600 lbs. per acre in 1970 to about 1,400 lbs. per acre in 1974.[1/] Experience

1/ Preliminary estimate for the current production year in the Northern Region.

and weather have also been important, however.

Concentration. In 1973 paddy production was concentrated in the Northern Region (54 %), Upper Region (16 %), Volta Region (13 %) and the Western Region (6 %).

Importance. Among the cereals domestically-produced, rice is increasing in relative importance in terms of acreage and output. It is most probable that a substitution effect away from starches to rice is taking place since rice appears to be a superior food from the Ghanaian point of view. If this substitution effect becomes more pronounced and takes place among an increasing proportion of the population the demand for rice will increase, assuming, of course, that the effective demand for food does not fall. This phenomenon will have important implication for the industry and producer incomes. The farm level supply of rice, like all food items, will be influenced by production costs, farm gate prices, transport costs, processing costs and retail prices. One of the major challenges facing the rice industry will be how to absorb decreasing import subsidies (because they are inevitable) and how to increase the productivity of resources being utilised in the production. The economic costs of present and expanded production are undoubtedly higher for rice than for any other food crop produced in Ghana.

e) Cassava

Cassava is a major food crop in the agricultural economy. It is produced in all regions, but is not an important crop in the Upper Region.

Holders. While there are no estimates of the number of holders for 1973 the number of holders increased by 35 percent between 1970 and 1972. In 1972 about 75 percent of the total agricultural holders in Ghana were producing this crop.

Acreage. Between 1970 and 1972 the acreage devoted to cassava in pure or mixed predominant stands remained relatively constant but between 1972 and 1973 the acreage declined by 7 percent. However, if mixed subsidiary stands are included in the acreage, estimated acreage devoted to cassava has steadily increased over the four-year period 1970 to 1973 by a rate of about 2 percent annually.

Production. The estimated production of cassava on a national basis increased by 18 percent between 1971 and 1972 and remained constant between 1972 and 1973. National production in 1972/73 was estimated to be about 2.7 million long-tons.

Yield . On the basis of pounds per acre cassava is the highest yielding crop in pure stand and one of the higher yielding crops in a mixed predominate stand.

TABLE 31: NATIONAL CASSAVA PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 2,350 | 2,769 | 2,776 |
| ACRES 1/ (000's) | A. | 312 | 312 | 311 | 288 |
| | B. | 805 | 805 | 840 | 870 |
| HOLDERS (000's) | | 478 | NA | 643 | NA |
| MEAN AREA (Per Holder) | | 1.7 | NA | 1.3 | NA |

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Volta | 11,200 | 10,300 |
| Ashanti | 10,100 | 880 |
| Eastern | 7,900 | 6,300 |
| Brong-Ahafo | 14,200 | 10,600 |
| Central | 7,600 | 9,800 |

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Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

A = Pure Stand and Mixed Predominant Stands.
B = Includes the acreage devoted to the crop in a subsidiary mixture.

**Concentration.** Cassava is a major crop in the southern humid tropical zone. About 62 percent of the national production is concentrated in three regions—Volta, Ashanti and Eastern Regions. These three regions account for 60 percent of the total acres and 61 percent of the total holders producing cassava. As Table 32 shows, Brong-Ahafo is also an important producer.

TABLE 32: 1973 MAJOR CASSAVA PRODUCING REGIONS, 1973

| Region | Production | | Acres 1/ | | Holders (1972) | |
|---|---|---|---|---|---|---|
| | National % | National Rank | National % | National Rank | National % | National Rank |
| Volta | 23 | 1 | 19 | 2 | 16 | 3 |
| Ashanti | 21 | 2 | 18 | 3 | 20 | 2 |
| Eastern | 18 | 3 | 23 | 1 | 25 | 1 |
| Brong-Ahafo | 13 | 4 | 13 | 4 | 10 | 6 |
| Total .. | 75 | | 73 | | 61 | |

1/ Includes cassava in a subsidiary mixture.

f) Cocoyam

**Importance.** In 1970 Cocoyam was an important food crop in the agricultural economy. It ranked 8th in acres cultivated among food crops and 2nd as to its relative contribution to the total value of agricultural production (See Table 33). In 1973 about 50 percent of the total holders in agriculture were producing this crop.

Holders. There has been a steady increase in the number of holders producing this crop since 1970. Since then, the number of holders has increased by about 46 percent or at an annual rate of about 12 percent. About 28 percent of the holders producing this crop are in the Ashanti Region.

Acres. Between 1970 and 1972 the acreage devoted to this crop declined by an estimated 35 percent but increased by about 9 percent between 1972 and 1973.

Production. The production of cocoyam declined sharply between 1971 and 1972 (65 percent) and doubled between 1972 and 1973. Over the three-year period 1971 to 1973, however, aggregate production declined by 28 percent. The decline and subsequent partial recovery of aggregate production appears in part to be explained by the change in total acres between 1971 and 1972.

It should be noted that about 90 percent of the acreage devoted to this crop is where cocoyam is a subsidiary component of a crop mixture. This possibly explains a large part of the rather violent changes in production.

TABLE 33: NATIONAL COCOYAM PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 1,800 | 636 | 1,302 |
| ACRES 1/ (000's) | A. | 97 | 97 | 64 | 66 |
| | B. | 888 | 888 | 575 | 627 |
| HOLDERS (000's) | | 299 | NA | 417 | 438 |
| MEAN AREA (Per Holding) | | 3.0 | NA | 1.4 | 1.4 |

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Ashanti | N.A. | 7,300 |
| Eastern | N.A. | 5,400 |
| Western | N.A. | 7,300 |
| Brong-Ahafo | N.A. | 3,900 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current AgriculturalStatistics Reports.

1/ A : Pure Stand and Mixed Predominant Stands.

B : Includes the Acreage Devoted to the Crop in a Subsidiary Mixture.

**Concentration.** The production of cocoyam is concentrated in four regions as shown in Table 34 below. The Ashanti, Eastern, Western and Brong-Ahafo Regions account for 87 percent of the national production, 87 percent of the total acres and 81 percent of the holders producing this crop.

TABLE 34: MAJOR COCOYAM PRODUCING REGIONS, 1973

| Region | Production | | Acres 1/ | | Holders | |
|---|---|---|---|---|---|---|
| | National % | National Rank | National % | National Rank | National % | National Rank |
| Ashanti | 30 | 1 | 26 | 1 | 28 | 1 |
| Eastern | 22 | 2 | 21 | 3 | 27 | 2 |
| Western | 20 | 3 | 18 | 4 | 11 | 4 |
| Brong-Ahafo | 15 | 4 | 22 | 2 | 15 | 3 |
| | 87 | | 87 | | 81 | |

1/ Includes Cocoyam as a subsidiary crop mixture.

g) Yams

**Holders.** The number of holders involved in the production of yam declined by about 6 percent between 1970 and 1972 but remained constant through production year 1973. Yam producers are in all regions of the country but there are relatively few in the Western and Upper Regions.

**Acres.** The acreage devoted to this crop declined 28 percent between 1971 and 1972 but increased by about 12 percent between 1972 and 1973 (on the basis of pure and mixed predominate stands).

The acreage expansion over this latter period was in the Ashanti, Northern and Brong-Ahafo Regions. The acreage of yams declined in the Western, Eastern and Central Regions.

Production. As with the acreage estimates, aggregate production declined between 1971 and 1972 and increased between 1972 and 1973. While production increased over the last reporting year aggregate production in 1973 was about 4 percent lower than estimated in 1971. The change in acreage devoted to this crop appears to be the main explanatory variable for aggregate production.

Yields. Yield estimates are only available for the production year 1971. Yam yields are highest in the Eastern Region followed by the Brong-Ahafo, Volta and Upper Regions.

TABLE 35 NATIONAL YAM PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 895 | 649 | 671 |
| ACRES 1/ (000's) | A. | 292 | 292 | 211 | 237 |
| | B. | 426 | 426 | 324 | 321 |
| HOLDERS (000's) | | 208 | NA | 195 | 195 |
| MEAN AREA (Per Holding) | | 2.0 | NA | 1.7 | 1.6 |

TABLE 35 (CONTD)

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Brong-Ahafo | 6,500 | 7,100 |
| Northern | 3,900 | 3,200 |
| Volta | 6,300 | 5,800 |
| Upper | 5,500 | 5,200 |
| Eastern | N.A. | 7,600 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A: Pure stand and mixed predominant stands.

B : Includes the acreage devoted to the crop in a subsidiary mixture.

Concentration. As Table 36 below shows, yam production is concentrated in three regions. The Brong-Ahafo, Northern and Volta Regions account for 75% of the national production, 89% of the total acres cultivated to yams and 58 % of holders producing the crop.

Importance. Yam is one of the more important food crops produced in Ghana. In 1970 it accounted for 8.4 percent of the total value added to agriculture (behind cocoa, plantain and cocoyam) and approximately 5 percent of the total cultivated acres (4th among food crops.)

TABLE 36: [redacted] MAJOR YAM PRODUCING REGIONS, 1973

| Region | Production National % | Production National Rank | Acres 1/ National % | Acres 1/ National Rank | Holders National % | Holders National Rank |
|---|---|---|---|---|---|---|
| Brong-Ahafo | 40 | 1 | 35 | 2 | 21 | 2 |
| Northern | 23 | 2 | 43 | 1 | 24 | 1 |
| Volta | 12 | 3 | 11 | 3 | 13 | 5 |
| | 75 | | 89 | | 58 | |

1/ Does not include yam in a subsidiary crop mixture.

h) Plantain

Importance. Plantain is an important food crop in all regions except the Northern and Upper Regions.

On the basis of a single crop's contribution to the total value of agricultural production, plantain was second only to cocoa, and among food crops ranked 1st in 1970 (See Table 37 ).

Holders. The number of holders producing plantain increased steadily over the four-year period 1970 to 1973. The average annual increase was about 5 percent.

Acres. On the basis of pure and mixed predominant stands the acreage of plantain has increased steadily since 1970 at an average annual rate of about 11 percent.

The proportion of pure stand and mixed predominant stands to total acreage of plantain has increased from 13 percent in 1970/71 to 32 percent in 1973 (See Table 37 ).

Production. The production of plantain declined very sharply (by 50 percent) between 1971 and 1972, and increased by 24 percent between 1972 and 1973. Given the steady increase of the number of acres and number of holders between 1971 and 1973 these violent swings in production are, however, questionable.

TABLE 37: NATIONAL PLANTAIN PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 3,230 | 1,632 | 2,026 |
| ACRES 1/ (000's) | A. | 187 | 187 | 198 | 270 |
| | B. | 1421 | 1,421 | 676 | 823 |
| HOLDERS (000's) | | 334 | NA | 386 | 403 |
| MEAN AREA (Per Holding) | | 4.3 | NA | 1.7 | 1.7 |

TABLE 37: (CONTD.)

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Ashanti | 6,800 | 6,800 |
| Central | 5,600 | 5,600 |
| Brong-Ahafo | 6,400 | 6,400 |
| Western | 17,000 | 3,800 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A: Pure stand and mixed predominant stands.
B: Includes the acreage devoted to the crop in a subsidiary mixture.

Yields. One a per acre basis plantain has a relatively high yield compared to other food crops grown. The yields are highest in the Ashanti and Brong-Ahafo Regions.

Concentration. The production of plantain is concentrated in three regions as shown by Table 38 below.

TABLE 38: MAJOR PLANTAIN PRODUCING REGIONS, 1973

| | Production | | Acres 1/ | | Holders | |
|---|---|---|---|---|---|---|
| Region | National % | National Rank | National % | National Rank | National % | National Rank |
| Ashanti | 40 | 1 | 41 | 1 | 35 | 1 |
| Central | 27 | 2 | 36 | 2 | 27 | 2 |
| B/Ahafo | 17 | 3 | 8 | 3 | 15 | 3 |
| | 84 | | 85 | | 77 | |

1/ Does not include plaintain in a subsidiary mixture.

i) Groundnuts

Holders. The number of holders producing groundnuts between 1972 and 1973 declined by about 15 percent. The major decline in the number of holders was in the Upper Region; however, the number of holders producing the crop increased slightly in the Northern Region.

Acreage. There has been a steady decline in the total acreage of groundnuts since 1970/71. Since 1971, on the basis of pure and mixed predominant stands, the acreage has declined by 34 percent. There has been a dramatic decline of groundnut acreage in the Upper Region from an estimated acreage of 157,000 acres in 1970 to 17,000 acres in 1973 (these acreage estimates include groundnuts in a subsidiary mixture). The 1973 acreage and production estimates for the Upper Region are highly questionable. Between 1972 and 1973 in the Upper Region the acreage presumably decreased by 89 percent whereas production was estimated to have increased by 48 percent! However, the acreage and production estimates for the Northern Region appear to be more consistent. Between 1972 and 1973 in the Northern Region the acreage of groundnut nearly doubled and the production increased by about 64 percent.

Production. Between 1971 and 1972 the aggregate production of groundnuts declined by 12 percent but increased by 36 percent between 1972 and 1973. This latter increase in production, despite the decline in national acreage can be explained in part by the expansion of acreage in the Northern Region.

TABLE 39: NATIONAL GROUNDNUT PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | 100 | 88 | 120 |
| ACRES 1/ | A. | 177 | 177 | 135 | 116 |
| | B. | 242 | 242 | 224 | 194 |
| HOLDERS (000's) | | 119 | NA | 141 | 120 |
| MEAN AREA (per Holding) | | 2.0 | NA | 1.5 | 1.6 |

MAJOR REGION YIELD ESTIMATES(LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Upper | 850 | 1,100 |
| Northern | 1,500 | 850 |
| Volta | 1,000 | 1,350 |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A: Pure stand and mixed predominant stands.

B: Includes the acreage devoted to the crop in a subsidiary mixture.

Concentration. A table for the concentration of groundnut production is not given because of the inconsistency between acreage and production estimates in the Upper Region. Despite this, however, one can say that production of groundnuts is concentrated in the Northern and Upper Regions. The Brong-Ahafo Region is third in importance in the production of this crop.

j) Beans and Cowpeas

Beans and Cowpeas are grown almost exclusively in the Upper Region; however, they are also produced in the Northern Region. The acreage and production of both these crops declined between 1972 and 1973. It is possible that this decline was largely due to the late rains in 1973, and the below normal rainfall. With regard to rainfall the current production year has been better and it is possible that farmers in the Upper Region produced more beans and cowpeas than last year.

It would appear that much work needs to be done to find improved varieties for these grain legumes and there ought to be a potential to expand production. For the Upper Region relatively drought resistant varieties will be required and possibly shorter maturity varieties.

TABLE 40: NATIONAL BEAN AND COWPEA PRODUCTION PARAMETERS

| | | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| PRODUCTION (000 long tons) | | NA | NA | 9 | 7 |
| ACRES 1/ (000's) | A. | 7 | 7 | 8 | 5 |
| | B. | 299 | 299 | 255 | 206 |
| HOLDERS (000's) | | 108 | NA | NA | NA |
| MEAN AREA (Per Holding) | | NA | NA | NA | NA |

MAJOR REGION YIELD ESTIMATES (LBS/ACRE)

| Region | Pure Stand | Mixed Predominant |
|---|---|---|
| Upper Northern) | N.A. | N.A. |

Source: Adapted from the 1970 Sample Census of Agriculture and Current Agricultural Statistics Reports.

1/ A : Pure Stand and Mixed Predominant Stands.

B : Includes the Acreage Devoted to the Crop in a Subsidiary Mixture.

## G. Rural Infrastructure.

### 1. Transportation Network and Facilities

A good road network and adequate transport are necessary in order to have a well functioning input delivery system and one which can have a widespread rural out-reach. A well-designed road network and an adequate fleet of road transport is necessary to evacuate farm produce to rural, terminal and retail markets. Both inputs and produce must be transported and delivered at the right place and at the right time if farmers are to have adequate incentives to use improved inputs and produce more.

The Assessment Team has not had time to adequately investigate this subject, and much of the information we have been able to collect is dated. However, we have tried to give a general picture of the system.

The Public Works Department of the Ministry of the Interior is the agency primarily responsible for the construction and maintainance of primary roads; there are about 9,000 miles of paved (2,600) and gravel roads (6,300) in Ghana. Although Ghana has one of the most extensive trunk or primary road networks in Africa, its rate of deterioration due to inadequate maintainance is alarming and has been well documented. 1/ In the past two years the government has extended the miles of paved roads in Ghana but at present we do not have the required figures.

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1/ Nathan Consortium for Sector Studies. "Transport Development in Ghana", May, 1970.

While we do not have the figures it is well known that the transportation sector requires further investment. Operating costs involve a great deal of foreign exchange. It has been estimated that about 90 % of the running costs involve foreign exchange.

The present vehicle fleet is old, estimated in 1967 to be 5.7 years and its size is increasing slowly in relation to the demand for transport services in agriculture. It is estimated that 3.5 million tons of all commodities were transported between regions on highways in 1969 . These transport demands were projected to increase by about 5.5 % per annum or to about 4.5 million tons in 1975. Import restrictions since 1972 will adversely affect the age of the vehicle fleet and the projected increase in total transport demand.

Transportation functions are provided by the State Transport Corporation and various marketing organizations such as the Grains Development Board and the Food Distribution Corporation. These costs, adjusted by average load factors were estimated in 1969 to have been NP's 12.48/ton/mile for a 3-ton mammy truck, NP 4.74 and 3.26 for 7-ton and 12-ton trucks, respectively. These costs vary considerably with road surfaces, the most dramatic disparities being between earth and bitumen surfaces. No doubt these costs have increased due to continued deterioration of roads, the age of the vehicle fleet and, of course, increases in fuel prices. It is not possible to revise these estimates in detail at this time

but it is likely that per ton mile costs are now NP 9.00 for 12-ton trucks.[1/]

There is some information on the overall volume of agricultural goods, excluding cocoa, which are marketed and transported on the primary road network. The table[2/] below is illustrative:

| Crop Category | Proportion of total production transported | Proportion of total transported moving to: South | North |
|---|---|---|---|
| Grains | 41 % | 94 % | 6 % |
| Root, tubers and plantains | 7 % | 75 % | 25 % |
| Other products | 21 % | 95 % | 5 % |
| Total | 12 % | 88 % | 12 % |

The volume of agricultural commodities transported generally shows less seasonality throughout the year than agricultural production. The transportation of tubers and plantains is less seasonal, than that of grains; volumes of grains transported are highest during the harvest in October - January. The bulk (57 %) of the total volumes of all goods transported on primary roads originates in two regions, the Eastern and Ashanti regions which in turn receive 53 % of the total volume transported. The Northern Regions, Upper, Northern and Brong-Ahafo generate only

1/ With a well-maintained fleet (7-12-ton trucks) the German Agricultural Development Project in the Northern Region has estimated their costs to be about NP 5 per ton mile for haulage of fertiliser from Tema to Tamale.

2/ IBID

20 % of this flow and receive even less, 18 %.[1]

The outreach of Ghana's transport system to the rural areas is constrained by the quantity and quality of secondary and feeder roads and their accessibility during different times of the year. There are about 11,000 miles of secondary and feeder roads in Ghana; however, these are mostly secondary roads; there is a serious lack of feeder roads which effectively link the rural areas to secondary and primary roads and therefore, to the urban markets. An inventory[2] of feeder roads in Ghana has been made recently and it contains recommendations for future developments; however, we were not able to obtain and review a copy of this report. The responsibility for construction and maintainance of secondary and feeder roads , is not with F.A.D., but with local and district councils and with private organizations. In the future any improvements in the feeder road network will have to be implemented at local levels through local councils, farmers associations and self-help groups since F.A.D. is likely not to take on the responsibility for their standards, construction and maintainance.

2. Water Resources.

This section deals with water resources in relation to irrigation. Domestic sources and uses are discussed in a later section on social amenities in rural areas.

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1/ IBID
2/ West African Development, Transportation Division, "An Appraisal of First Highway Project/Ghana, June 1973.

<u>The Problem.</u> Much of Ghana (particularly the Upper, Northern, and Brong-Ahafo Regions) has long dry seasons. During these periods, which range up to 5 months, there is a great deal of underemployment in rural areas. Many people have therefore advocated irrigation as a requirement or one way to increase agricultural production in Ghana.

However, very little is known about Ghana's underground water resources. There is little water resource legislation particularly with regard to water-use rights. Problems are likely to develop in this area if appropriate legislation is not developed and enacted in the near future.

<u>Role of Irrigation.</u> Rainfed agriculture (i.e., timing the cropping patterns to the rainy season) will probably predominate in the Central, Western, Ashanti and parts of the Brong-Ahafo Regions because the prevailing rainfall is normally adequate for the type of crops grown.

In the drier regions (including the Accra Plains) there may be an important role for irrigation particularly if small-scale irrigation systems can be developed. The major advantage for irrigation in these areas will be to permit a second crop(s) and to lessen the risk of dry land farming when the outcome depends so much on the timing, absolute amounts and distribution of the rains. Irrigation schemes could be an employment generator if designed on a small-scale basis and dependent upon labor intensive production techniques.

Present Development of Irrigation. Table 41 shows that in 1974 there are 10 on-going irrigation projects in Ghana, to eventually cover a total of 25,800 acres. The major schemes are located at Asutsuare in the South-east (10,000 acres), the Vea Dam in the Upper Region (3,500 acres), Akomadan in the mid-east (3,500 acres) and Afife in the Volta Region (2,500 acres).[1/]

Seven new irrigation projects are presently being implemented, intended to eventually irrigate 31,000 acres (See Table 41).

Constraints. The principle obstacles for successful irrigation development are a lack of experience at the project level both on the part of management personnel and participating farmers. The basic considerations in developing an effective irrigation program in Ghana would include:

1) Appropriate technical and economic feasibility studies at the planning stage;
2) Designing small-scale irrigations systems which can productively absorb labor;
3) Highly intensive, double cropping of high value crops;
4) A training program for participating farmers to learn new techniques of production under irrigated practices;
5) Appropriate selection of output increasing technological packages;
6) Developing appropriate management and supervisory staff to implement and operate the irrigation schemes, and

1/ Potential acreage that could be irrigated. It is not known to the team how many acres are actually irrigated.

TABLE 41: IRRIGATION PROJECTS IN GHANA

| Projects | Location | Acres Irrigable | Estimated Capacity of Reservoir (Acre-feet) |
|---|---|---|---|
| On-going | | 25,800 | |
| Ashiaman | South-east | 500 | 4,200 |
| Vea | North | 3,500 | 12,800 |
| Asutsuare | South-east | 10,000 | NA |
| Komenda | South-west | 3,000 | NA |
| Dawhenya | South-east | 1,200 | 5,300 |
| Winneba Okyereko | South-east | 300 | 2,000 |
| Mankesim | " | 800 | 4,200 |
| Akomadan | Mid-west | 3,500 | NA |
| Afram Plain | Eastern Region | 500 | NA |
| Afife | Volta Region | 2,500 | 5,200 |
| New Projects | | 30,900 | |
| Weija | South-east | 5,600 | 92,000 |
| Kpong | " | 5,000 | NA |
| Swedru-Ayensu | " | 8,600 | 38,660 |
| Aviemo | " | 1,000 | NA |
| Bontango | North | 1,200 | 10,500 |
| Passam | " | 3,000 | 31,600 |
| Navrongo-Tono | Extreme North | 6,500 | 62,000 |
| Feasibility | | 853,100 | |
| Mpaha | Mid | 13,000 | NA |
| Lamasse | Mid | 3,200 | NA |
| Tamale-White Volta | North-East | 3,600 | 30,000 |
| Bualugu | " | 238,600 | 376,000 |
| Ave - Keta | South-east | 74,700 | NA |

7) Develop procedures to insure provision of required technical inputs and an effective produce evacuation system.

3. Social Amenities.

Social amenities, such as health and educational facilities, electricity and the provision of rural water supplies, determines, in part, the extent to which Ghana could maintain an adequate percentage of the population in rural occupations. Although one is not certain of the extent to which lack of social amenities contributes to rural-urban migration, it is not an over-exaggeration to suppose that a significant proportion of rural-urban migration, particularly of the educated, is the result of lack of such amenities. Owing to the free-compulsory education which was introduced during the First Republic, many parents, particularly in Southern Ghana, enrolled their children in schools. The desire on the part of children and parents to obtain some education appears to be fairly high. It is common to see rural children walking long distances to attend school.

The nature of rural life exposes rural residents to various diseases and accidents. In order to improve the standard of rural health a much improved health delivery system will have to be developed. This will require increased investment in rural health posts, mobile clinics and training of medical and para-medical staff. The outreach of these services will need to be greatly improved.

An increased provision of rural water supplies for domestic purposes would contribute much to improved health. Many villages do not have adequate water supplies, particularly clean or unpolluted water.

The provision of easily accessible village water supplies would release labor for field work, as women and children spend a great deal of time fetching water for domestic purposes.

In addition, more attention to the provision of electricity in rural areas would improve the social environment and also act as a stimulus to small-scale rural industrialization.

Health Facilities. On the average national health expenditures (current and capital) per capita increased by ¢2.62 million (70 %) from 1971 to 1974. The most significant increases were in the Central and Volta Regions where the increases were 123 % and 104 % respectively. In the Northern Region, Government health expenditures per unit of population decreased by 12 %. In all other regions increases were over 50 % (See Table 42 ).

Table 43 shows the number of hospitals, health centers and posts, and those under construction during 1974. Whereas the number of government hospitals increased from the 1970 figure of 55 to 57 in 1974, the number of private hospitals decreased from 64 to 47 during the same period. The number of government health centers, however, increased from 38 to 57. Operating health posts were 41 in 1974 and it is on record that 8 health centers and 56 health posts were under construction in 1974. It must be mentioned that although private hospitals have greatly contributed to easing the congestion at government hospitals, private consulting fees tend to be too high for common persons.

TABLE 42: PER CAPITA CURRENT AND CAPITAL BUDGET EXPENDITURES ON HEALTH BY REGION

| | 1971 | 1974 | % Change |
|---|---|---|---|
| National Average | 3.76 | 6.38 | 70 |
| Western | 3.72 | 6.89 | 85 |
| Central | 3.32 | 7.39 | 123 |
| Greater Accra | 4.49 | 8.81 | 96 |
| Eastern | 3.15 | 5.83 | 85 |
| Volta | 3.08 | 6.27 | 104 |
| Ashanti | 3.58 | 6.04 | 69 |
| Bong-Ahafo | 3.14 | 4.93 | 57 |
| Northern | 6.48 | 5.80 | -12 |
| Upper | 2.92 | 5.59 | 91 |

Note: 1970 Population Estimates were used to derive per capita expenditure.

TABLE 43: REGIONAL NUMBER OF HOSPITALS AND HEALTH POSTS 1974
(OPERATING AND UNDER CONSTRUCTION)

| | Operating | | | | Under Construction | |
|---|---|---|---|---|---|---|
| Area | Govt. Hosp. | Private Hosp. | Health Centers | Health posts | Health centers | Health posts |
| Western | 7 | 4 | 5 | - | - | 6 |
| Central | 5 | 3 | 2 | 8 | 2 | 10 |
| Greater Accra | 10 | 4 | 9 | 1 | 1 | 3 |
| Eastern | 9 | 5 | 8 | 8 | 2 | 7 |
| Volta | 6 | 7 | 7 | 11 | - | 2 |
| Ashanti | 7 | 16 | 9 | - | 2 | 9 |
| Brong-Ahafo | 2 | 7 | 8 | 7 | 1 | 6 |
| Northern | 6 | 1 | 6 | 2 | - | 6 |
| Upper | 5 | - | 3 | 4 | - | 7 |
| Ghana 1/ | 57 (55) | 47 (64) | 57 (38) | 41(N.A.) | 8 | 56 |

Source: Ministry of Health

1/ Figures in brackets are the 1970 totals.

Table 44 indicates that the quantity of medical personnel is very low. The most alarming situation is in the Upper Region where a doctor, on the average, attends 100,000 people. Even in Greater Accra where most medical facilities are available the ratio of doctors to population is one to 6,000. The basic fact is that in addition to the need for more health units existing units are under-staffed.

TABLE 44: HOSPITAL FACILITIES AND DOCTOR POPULATION

| Area | Hospital Facilities: Hospital beds 3/ | Hospical cots 3/ | Pop. per bed/cot 1/ | Doctors 1/ per pop. | Pop. 1970 |
|---|---|---|---|---|---|
| Western 2/ | N.A. | N.A. | 1000.0 | 1:13000 | 770,087 |
| Central | 1020 | 189 | 1000.0 | 1:55000 | 890,509 |
| Greater Accra | 1493 | 406 | 290.1 | 1:6000 | 851,614 |
| Eastern | 917 | 279 | 967.9 | 1:43000 | 1,261,661 |
| Volta | NA | NA | 752.2 | 1:55000 | 947,268 |
| Ashanti | 1324 | 265 | 886.2 | 1:19000 | 1,481,698 |
| B/Ahafo | 411 | 125 | 1518.9 | 1:63000 | 766,509 |
| Northern | 400 | 125) | 1209.3 | 1:43000 | 727,618 |
| Upper | 510 | 196) | | 1:100000 | 862,723 |
| Ghana | 6075 | 1585 | 829.4 | 1:12700 | 8,599,313 |

1/ Data for 1971
2/ Western and Central done as one region
3/ Data for 1972

There are three basic constraints to improved health in Ghana; namely the requirements (1) to train more doctors and para-medical personnel, (2) to construct additional health units and particularly low-cost units in outlying rural areas, (3) to increase provision of rural water supplies, and (4) to expand rural education on sanitation techniques and the benefits of health services.

Education. Table 45 shows that there was a general increase in educational expenditure per capita during 1971-74. In 1974 the national average was 40% above that of 1971. Brong-Ahafo and Ashanti Regions ranked first and second in terms of the magnitude of the increase. The increases in these two regions were 59 % and 57 % respectively. Besides the Volta Region, where the increase was 24 %, all other regions had increases above 30 %.

Tables 46-48 show the total number of persons 6 years and over who have: 1) never attended school, 2) who have attended school in the past, and 3) those currently attending school. Those attending school have increased in all regions during the period 1960 to 1970. Table 47 shows that with the exception of Greater Accra, and Northern and Upper Regions the number of persons who have never attended school decreased between 1960 and 1970. The increase in the number of persons who have never attended school in the Greater Accra Region can probably be explained by the migration of this class from other regions to Accra, to seek urban employment . The increase in the group "never attended" school in the Northern and Upper Regions probably can be explained by farm labor requirements, distance to schools, relatively fewer school seats, and maybe a lesser desire for schooling.

TABLE 45: PER CAPITA CURRENT AND CAPITAL BUDGET EXPENDITURES ON EDUCATION BY REGION 1/

| | 1971 | 1974 | % Change |
|---|---|---|---|
| National Average | 17.85 | 25.00 | 40 |
| Western | 19.46 | 27.51 | 41 |
| Central | 19.96 | 26.70 | 34 |
| Greater Accra | 20.26 | 29.90 | 48 |
| Eastern | 21.61 | 28.40 | 31 |
| Volta | 21.98 | 27.29 | 24 |
| Ashanti | 18.79 | 29.57 | 57 |
| Brong-Ahafo | 14.96 | 23.73 | 59 |
| Northern | 11.95 | 16.41 | 37 |
| Upper | 11.71 | 15.45 | 32 |

1/ 1970 Population aged 6 - 24 years was used to derive per-capita expenditure.

Generally the number of people capable of schooling (including past attendance) was greater for females than males. The number of females "never attended" was greater than males in this category; the number of females "presently attending" were fewer than males in this category. The explanation for this may be the long-held notion of many parents that there is little gain from educating females.

The combined effects of (1) increase in the total number of people capable of attending school (including "past attended"), (2) the decrease in the number of "never attended", and (3) an increase in the number "presently attending" indicate that there has been increasing school attendance during the 1960's.

On the basis of the relative importance of rural and urban education, the 1960 population census shows that the total number of persons capable of attending school (including past attended) was greater in the rural areas than in urban areas (See Table 49). Table 50 shows that with the exception of Greater Accra, the number who "never attended" was greater for rural areas than urban areas.

An interesting point is shown by Table 51 which indicates that the number of persons presently attending school is greater for the rural areas than for the urban areas. This could be the result

of 1) the free-compulsory education initiated by the government after independence which laid emphasis on educating the rural population, and 2) the relative absolute size of rural and urban populations.

TABLE 46: TOTAL NUMBER OF PERSONS 6 YEARS AND OVER WHO ARE CAPABLE OF SCHOOLING ("NEVER", PAST, PRESENT), 000's

| | | 1960 | | 1970 | |
|---|---|---|---|---|---|
| National | M | 26446.6 | | 3306.0 | |
| | F | 2555.5 | | 3365.5 | |
| | T | | 5200.1 | | 6671.5 |
| Western & Central | M | 541.4 | | 647.5 | |
| | F | 526.6 | | 656.3 | |
| | T | | 1068.0 | | 1303.8 |
| Greater Accra | M | 214.0 | | 365.0 | |
| | F | 181.7 | | 320.9 | |
| | T | | 395.7 | | 685.9 |
| Eastern | M | 430.0 | | 491.0 | |
| | F | 419.2 | | 503.8 | |
| | T | | 849.2 | | 994.8 |
| Volta | M | 293.1 | | 353.3 | |
| | F | 309.9 | | 388.8 | |
| | T | | 603.0 | | 742.1 |
| Ashanti | M | 463.9 | | 569.6 | |
| | F | 405.5 | | 574.6 | |
| | T | | 842.4 | | 1144.2 |
| Brong-Ahafo | M | 239.6 | | 300.7 | |
| | F | 207.1 | | 282.8 | |
| | T | | 446.7 | | 583.5 |
| North & Upper | M | 489.6 | | 588.8 | |
| | F | 505.5 | | 628.2 | |
| | T | | 995.2 | | 1217.0 |

TABLE 47: PERSONS AGED 6 YEARS AND OVER WHO HAVE NEVER ATTENDED SCHOOL (000's)

| | | 1960 | | 1970 | |
|---|---|---|---|---|---|
| National | M | 1675.4 | | 1564.4 | |
| | F | 2120.1 | | 2227.3 | |
| | T | | 3795.5 | | 3791.9 |
| Western and Central | M | 325.3 | | 272.9 | |
| | F | 444.4 | | 439.9 | |
| | T | | 769.7 | | 712.8 |
| Greater Accra | M | 89.2 | | 89.9 | |
| | F | 120.0 | | 153.3 | |
| | T | | 209.2 | | 243.2 |
| Eastern | M | 235.6 | | 179.2 | |
| | F | 315.8 | | 284.1 | |
| | T | | 551.4 | | 463.3 |
| Volta | M | 159.0 | | 144.0 | |
| | F | 241.6 | | 246.4 | |
| | T | | 400.6 | | 390.4 |
| Ashanti | M | 245.2 | | 226.2 | |
| | F | 321.2 | | 329.0 | |
| | T | | 566.4 | | 555.2 |
| B/Ahafo | M | 174.5 | | 162.5 | |
| | F | 183.6 | | 194.3 | |
| | T | | 358.1 | | 356.8 |
| North & Upper | M | 446.6 | | 489.2 | |
| | F | 493.5 | | 585.6 | |
| | T | | 940.1 | | 1074.8 |

Source: 1960 and 1970 Population Census

TABLE 48: PERSONS AGED 6 YEARS AND OVER WHO ARE PRESENTLY ATTENDING SCHOOL (000's)

| | | 1960 | | 1970 | |
|---|---|---|---|---|---|
| National | M | 491.0 | | 940.9 | |
| | F | 247.1 | | 687.4 | |
| | T | | 738.1 | | 1628.3 |
| Western and Central | M | 107.2 | | 202.5 | |
| | F | 48.9 | | 138.4 | |
| | T | | 165.1 | | 340.9 |
| Greater Accra | M | 45.8 | | 100.9 | |
| | F | 31.7 | | 85.8 | |
| | T | | 77.5 | | 186.7 |
| Eastern | M | 101.1 | | 177.0 | |
| | F | 59.2 | | 134.4 | |
| | T | | 160.3 | | 311.4 |
| Volta | M | 70.5 | | 120.1 | |
| | F | 37.9 | | 84.7 | |
| | T | | 108.4 | | 204.8 |
| Ashanti | M | 102.5 | | 197.5 | |
| | F | 47.2 | | 59.8 | |
| | T | | 149.7 | | 257.3 |
| B/Ahafo | M | 36.5 | | 81.1 | |
| | F | 136.6 | | 56.9 | |
| | T | | 50.1 | | 138.0 |
| Northern & Upper | M | 27.2 | | 61.6 | |
| | F | 8.6 | | 27.4 | |
| | T | | 35.8 | | 89.0 |

Source: 1960 and 1970 Population Census (the 1960 Figures are from the advanced report)

TABLE 49: TOTAL NUMBER OF PERSONS 6 YEARS AND OVER WHO ARE CAPABLE OF ATTENDING SCHOOL ("NEVER", PAST, PRESENT,) ON URBAN AND RURAL BASIS, 1960 (000's)

| | | URBAN | | RURAL | |
|---|---|---|---|---|---|
| National | M | 636.3 | | 2005.3 | |
| | F | 588.7 | | 1966.8 | |
| | T | | 1228.0 | | 3972.1 |
| Western and Central | M | 147.5 | | 393.9 | |
| | F | 140.9 | | 385.7 | |
| | T | | 288.4 | | 779.5 |
| Greater Accra | M | 171.6 | | 42.4 | |
| | F | 145.2 | | 36.6 | |
| | T | | 316.8 | | 78.9 |
| Eastern | M | 87.3 | | 342.7 | |
| | F | 87.0 | | 332.2 | |
| | T | | 174.3 | | 674.9 |
| Volta | M | 39.6 | | 253.5 | |
| | F | 42.3 | | 267.5 | |
| | T | | 81.9 | | 521.0 |
| Ashanti | M | 116.0 | | 253.5 | |
| | F | 99.7 | | 267.5 | |
| | T | | 215.7 | | 521.0 |
| B/Ahafo | M | 36.8 | | 202.8 | |
| | F | 33.9 | | 173.2 | |
| | T | | 70.7 | | 376.1 |
| North and Upper | M | 40.5 | | 449.2 | |
| | F | 39.7 | | 465.9 | |
| | T | | 80.2 | | 915.0 |

TABLE 50: PERSONS AGED 6 YEARS AND OVER WHO HAVE NEVER ATTENDED SCHOOL (URBAN AND RURAL), 1960 (000's)

| | | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| National | M | | 290.4 | | 1385.1 | |
| | F | | 413.2 | | 1706.9 | |
| | | T | | 703.6 | | 3092.0 |
| Western and Central | M | | 69.7 | | 255.6 | |
| | F | | 103.1 | | 341.3 | |
| | | T | 172.8 | | | 596.9 |
| Greater Accra | M | | 64.0 | | 25.1 | |
| | F | | 89.9 | | 30.1 | |
| | | T | | 153.9 | | 55.2 |
| Eastern | M | | 37.1 | | 198.5 | |
| | F | | 58.3 | | 257.5 | |
| | | T | | 95.4 | | 146.0 |
| Volta | M | | 16.0 | | 143.0 | |
| | F | | 30.0 | | 211.6 | |
| | | T | | 46.0 | | 354.6 |
| Ashanti | M | | 54.3 | | 143.0 | |
| | F | | 69.1 | | 211.6 | |
| | | T | | 123.4 | | 354.6 |
| B/Ahafo | M | | 21.2 | | 153.3 | |
| | F | | 27.3 | | 156.3 | |
| | | T | | 48.5 | | 309.6 |
| North and Upper | M | | 28.0 | | 418.6 | |
| | F | | 35.5 | | 458.0 | |
| | | T | | 63.5 | | 876.6 |

TABLE 51: PERSONS AGED 6 YEARS AND OVER WHO ARE PRESENTLY ATTENDING SCHOOL ( URBAN AND RURAL) 1960 (000's)

| | | Urban | | Rural | |
|---|---|---|---|---|---|
| National | M | 142.5 | | 384.4 | |
| | F | 93.7 | | 153.4 | |
| | T | | 236.2 | | 501.8 |
| Western and Central | M | 33.5 | | 73.7 | |
| | F | 20.7 | | 28.1 | |
| | T | | 54.2 | | 101.8 |
| Greater Accra | M | 36.7 | | 9.1 | |
| | F | 27.6 | | 4.1 | |
| | T | | 64.3 | | 13.2 |
| Eastern | M | 22.5 | | 78.6 | |
| | F | 15.6 | | 43.6 | |
| | T | | 38.1 | | 122.2 |
| Volta | M | 11.7 | | 58.7 | |
| | F | 7.1 | | 30.8 | |
| | T | | 18.9 | | 89.5 |
| Ashanti | M | 24.6 | | 58.7 | |
| | F | 16.3 | | 30.8 | |
| | T | | 40.9 | | 89.5 |
| B/Ahafo | M | 7.7 | | 28.9 | |
| | F | 3.6 | | 9.9 | |
| | T | | 11.3 | | 38.8 |
| North and Upper | M | 5.8 | | 21.5 | |
| | F | 2.6 | | 6.0 | |
| | T | | 8.4 | | 27.5 |

Electricity and Water. The main source of electricity in Ghana are from the Akosombo Dam, local government generating plants and smaller private plants. The great majority of the population, particularly in rural towns and villages do not have electricity. The major sources of light for rural population are kerosine lamps and candles. In 1970 only 0.9 % of the population consumed electricity for domestic purposes. Consumption of electricity in the Upper Region was negligible and the highest consuming center was the Greater Accra Region where 4.3 % of the population consumed electricity. With these low percentages (See Table 52.) there is practically no consumption of electricity in the semi-urban areas and the rural areas.

There are five sources of water supply in Ghana. These are wells, boreholes with pumps, ponds, rivers and public water works. The first four sources are the major source of water for most people. There is shortage of water during the dry season in most regions particularly the Northern and Upper Regions. At present public water works are restricted to cities and big towns.

Obviously there is a need to expand public water works (piped water) in many parts of the country. In most rural areas in the foreseable future, well development seems to be a major priority along with the construction of labor-intensive earthern dams.

Table 52:

/NUMBERS OF DOMESTIC CONSUMERS OF ELECTRICITY AND OF WATER SUPPLY SOURCES 1/ ( 1970 )

| Area | Regional Population 2/ | Domestic Consumers of Electricity 3/ | * | water Supply 4/ | Regional population per Water Supply Source 5/ |
|---|---|---|---|---|---|
| Western | 770,087 | 8,377 | 1.0 | 554 | 1,390 |
| Central | 890,509 | 5,203 | 0.6 | 600 | 1,484 |
| Greater Accra | 851,614 | 36,675 | 4.3 | 6 | 141,936 6/ |
| Eastern | 1,261,661 | 5,375 | 0.4 | 572 | 2,206 |
| Volta | 947,268 | 12,180 | 0.2 | 422 | 2,245 |
| Brong/Ahafo | 766,509 | 827 | 0.1 | 624 | 1,244 |
| Northern | 727,618 | 1,966 | 0.3 | 878 | 829 |
| Upper | 862,723 | 364 | Negligible | 583 | 1,480 |
| Ghana | 8,599,313 | 74,583 | 0.9 | 4,575 | 1,808 |

1/ Includes wells, boreholes with pumps, ponds and water works sources.

2/ Pop. Census 1970.

3/ Electricity Corporation; 4/ Water and Sewerage Corporation.

5/ To the nearest whole number; 6/ With the exception of Greater Accra where 80 % of water is from water work sources. The rest are mainly from well, ponds, etc. Villages get water from rivers.

* (Electricity Consumers
(As Percent of Regional
(Population

H. Farm Input Delivery System.

The major inputs supplied to farmers by the Ministry of Agriculture are fertilizers, improved seeds, agro chemicals, machinery-hire services and hand tools particularly cutlasses. Credit is handled mainly by the Agricultural Development Bank (ADB).

1. Fertilizer

The Ministry of Agriculture is the main importer of fertilizer, assisted by the German Aid Program. However a few private institutions also import (Shell Company, Sugar Estates and Ejura Farms). The imports of Shell and Ejura are for their private use.

The types of fertilizer imported into the country are sulphate of ammonia, 15-15-15, 20-20-20, single superphosphate, triple superphosphate, muriate of potash, 3-25-18 and 5-20-15. Whereas the first six are used by private farmers the latter two are mainly used b the Ghana Tobacco Company limited which is part of the Ministry of Agriculture. The period of importation of fertilizer ("fertilizer-year") is June of Year X to July of year X + 1.

In 1974, a total of 249,400 bags (12,470 tons) of fertilizer was imported by the Government. This excludes the importation of fertilizer by private institutions mentioned above. The imports of fertilizer in 1974 showed a decrease of

17,256 tons (58.1%) from the 1973 level of 29,726 tons. The major fertiliser imports during these two years 1973 and 1974 were sulphate of ammonia, 15-15-15, 20-20-0 and triple - superphosphate. Most of the imports were distributed to the Northern, Upper and Ashanti Regions. The distribution to regional depots is under the direction of/Deputy Director of Agriculture in charge of Extension. The Regional Agricultural Committees (RACOM) are responsible for the distribution within their regions. The Regional Commissioner for each region is generally informed of quantities of fertiliser supplied to his region, to help prevent unauthorised channelling of fertiliser into private hands for smuggling into neighboring countries.

Tables 53-57 show fertiliser imports by the Ministry of Agriculture from 1960 / to 1974, and the regional distribution of the imports of fertiliser for 1973 and 1974.

There is a high subsidy on fertiliser in Ghana. On the average, 112 lbs. of fertiliser is subsidized by ¢ 10.18 which is equivalent to / 77 percent of the CIFprice. Table 57 shows the prices at which fertilizers are sold to farmers and the corresponding subsidy levels.

2. Improved Seeds

The Seed Multiplication Unit (SMU) of the MOA multiplies and distributes a large proportion of the improved seeds used in Ghana. These improved seeds are rice, maize, groundnuts and

TABLE 53: MINISTRY OF AGRICULTURE FERTILIZER IMPORTS 1960-74[1] QUANTITY IN TONS

| FERTILIZER/YEAR [2] | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 [2] German | 1974 [2] Ghana | 1974 [2] Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **STRAIGHTS** | | | | | | | | | | | | | | | | | |
| Sulphate of Ammonia | | | | | | | | | 1053 | 1306 | 2084 | 1431 | 2160 | 8100 | 1000 | 2650 | 3650 |
| Single Superphosphate | | | | | | | | | 150 | 1700 | - | - | - | 1500 | 1000 | 300 | 1300 |
| Triple Superphosphate | | | | | | | | | 400 | 560 | 1046 | 336 | - | 300 | | 200 | 200 |
| Muriate of Potash | | | | | | | | | 108 | 275 | 337 | 405 | 450 | 200 | | 10 | 10 |
| Urea And Others | | | | | | | | | 25 | 570 | 610 | 2810 | - | - | | 10 | 10 |
| Nitrogen Fertilizers | | | | | | | | | - | - | - | - | - | - | - | - | - |
| **COMPOUNDS** | | | | | | | | | | | | | | | | | |
| 20-20-0 | | | | | | | | | 900 | 560 | 1000 | - | 3760 | 3417.5 | | 1000 | 1000 |
| 15-15-15 | | | | | | | | | 2150 | 500 | 4100 | 5080 | 8520 | 14278.5 | 4500 | 1500 | 6000 |
| 3-25-18 | | | | | | | | | - | - | - | - | 760 | 1000 | | 300 | 300 |
| 5-20-15 | | | | | | | | | - | - | - | - | 244 | 930 | | - | - |
| Others | | | | | | | | | 500 | 670 | - | - | - | - | | - | - |
| TOTAL | 1304 | 1925 | 2894 | 5619 | 4055 | 6296 | 5429 | 649 | 5278 | 6177 | 9177 | 9937 | 15834 | 29726.0 | 6500 | 5970 | 12470 |

Source: MOA Records and NIB Fertilizer Feasibility Studies

1. The breakdown between German Government's grant imports and Ghana Government's imports are given for 1974.
2. The German Aid Program has to date committed 11,000 tons of fertilizer for 1975 (grant aid).
3. Fertilizer year is June of year X to July of year X + 1

TABLE 54: MINISTRY OF AGRICULTURE REGIONAL FERTILIZER DISTRIBUTION, 1973 (QUANTITY IN TONS)

| Region | Sulphate of Ammonia | 15-15-15 | 20-20-0 | Single Superphosphate | Triple Superphosphate | Muriate | 3-25-18 | 5-20-15 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Eastern | 178 | 1,550 | 250 | - | 50 | - | | | 2,028 |
| Greater Accra | 414 | 2,051 | 300 | 30 | 50 | 25 | | | 2.870 |
| Central | 348 | 676 | 126 | - | 50 | 45 | | | 1,245 |
| Western | 100 | 250 | 20.5 | - | - | - | | | 3,705 |
| Ashanti | 830 | 1,926 | 178 | 20 | 100 | 100 | | | 3,154 |
| Brong-Ahafo | 92 | 500 | 175 | - | - | - | | | 767 |
| Volta | 245 | 676.5 | 118 | - | - | - | | | 1,039.5 |
| Northern | 3,763 | 4,500 | 1,900 | 800 | 50 | 30 | | | 11,043 |
| Upper | 2,130 | 2,149 | 350 | 650 | - | - | | | 5,279 |
| Ghana Tobacco Co. | - | - | - | - | - | - | 1,000 | 930 | 1,930 |
| TOTAL | 8,100 | 14,278.5 | 3,417.5 | 1,500 | 300 | 200 | 1,000 | 930 | 29,726 |

Source: MOA Records

TABLE 55: MINISTRY OF AGRICULTURE FERTILIZER IMPORTS 1974 (QUANTITY IN TONS)

| Fertiliser | Quantity Ordered 1/ | Country of Origin | Price/Ton CIF, Tema |
|---|---|---|---|
| 15-15-15 | 6,000 | West Germany | ¢325.00 |
| 20-20-0 | 1,000 | | 285.30 |
| 3-25-18 | 300 | | 264.40 |
| Sulphate of Ammonia | 4,150 | " | 189.11 |
| Single Superphosphate | 800 | | 144.26 |
| Triple Superphosphate | 200 | " | 300.88 |
| Muriate of Potash | 10 | " | 175.22 |
| Urea | 10 | | 393.17 |
| TOTAL | 12,470 | - | - |

Source: MOA Source Records

1/ Includes 6,500 tons of grant aid from the German Government.

Table 56:

MINISTRY OF AGRICULTURE, REGIONAL FERTILIZER DISTRIBUTION 1974 (QUANTITY IN TONS)

| REGION | Sulphate of Ammonia | 15-15-15 | 20-20-0 | Single Superphosphate | Triple Superphosphate | Muriete of Potash | Urea | 3-25-18 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Eastern | 100 | - | 250 | - | - | - | - | - | 350 |
| Greater Accra | 100 | 50 | 150 | 60 | 100 | 10 | 10 | - | 480 |
| Central | 250 | 100 | 150 | - | - | - | - | - | 500 |
| Western | - | 100 | - | - | - | - | - | - | 100 |
| Ashanti | 500 | - | 250 | - | 50 | - | - | - | 800 |
| Brong-Ahafo | 100 | - | 100 | - | - | - | - | - | 250 |
| Volta | 100 | - | 100 | - | - | - | - | - | 200 |
| Northern | 2,300 | 5,000 | - | 340 | - | - | - | - | 7,640 |
| Upper | 700 | 750 | - | 400 | - | - | - | - | 1,850 |
| Ghana Tobacco Co. Accra | - | - | - | - | - | - | - | 300 | 300 |
| TOTAL | 4,150 | 6,000 | 1,000 | 800 | 200 | 10 | 10 | 300 | 12,470 |

SOURCE: MOA Records.

Table 57:

**MINISTRY OF AGRICULTURE FERTILIZER PRICES AND SUBSIDY LEVELS**

| Fertilizer | Price/Ton CIF Tema (¢)3/ A | Price Per 112-lbs. (¢) CIF Tema B = A x 0.05 | Transport Charge/112-lbs. From Tema - Accra (¢) C | Price/112-lbs. At Accra D = B + C | Sales Price Per 112-lbs. By MOA (¢) E | Subsidy1/2/ Level (¢) D - E | % Subsidy4/ |
|---|---|---|---|---|---|---|---|
| 15-15-15 (Compound) | 325.00 | 16.25 | 0.25 | 16.50 | 2.80 | 13.70 | 83.0 |
| 20-20-0 ( " ) | 285.30 | 14.26 | " | 14.51 | 2.80 | 11.71 | 80.7 |
| 3-25-18 ( " ) | 264.40 | 13.22 | " | 13.47 | NA | NA | NA |
| Sulphate of Ammonia | 189.11 | 9.46 | | 9.71 | 2.00 | 7.71 | 79.4 |
| Single Superphosphate | 144.26 | 7.21 | | 7.46 | 1.90 | 5.56 | 74.5 |
| Triple Superphosphate | 300.88 | 15.04 | | 15.29 | 3.80 | 11.49 | 75.1 |
| Muriate of Potash | 175.22 | 8.76 | | 9.01 | 2.00 | 7.01 | 77.8 |
| Urea | 393.17 | 19.66 | | 19.91 | 5.80 | 14.11 | 70.9 |
| **Others** | | | | | | | |
| 12-10-10 (Mixture) ) | | | | | 2.80 | | |
| Sulphate of Potash ) | NA | NA | | NA | 2.00 | NA | NA |
| Lime ) | | | | | 3.00 | | |
| Kieserite ) | | | | | 3.80 | | |
| Average Subsidy | - | - | | - | - | 10.18 | 77.34 |

SOURCE: Computed from MOA Records

1/ Within a radius of up to 5 miles transport charge is ¢3.00 per ton (¢0.15 / 112-lbs.)
Within a radius of up to 25 miles transport charge is ¢5.00 " (¢0.25 / 112-lbs.)
From Tema to Accra is 18 miles and so the charge is ¢0.25 / 112-lbs.

2/ Excludes the transport charges of 8 1/2 pesewas per mile per ton of fertiliser transported to the regions

3/ Year 1974

4/ Proportion of the input price that the farmer does not pay.

a small quantity of vegetable seeds.

The SMU does not produce improved seeds directly but rather contracts with private farmers known as Registered Seed Growers. These are farmers chosen by the Unit and who are closely supervised by SMU staff in order to produce certified seed. Two private companies, Maypole Seed Company Ltd. and Gbedemah and Kpodo Company Ltd., import large quantities of vegetable seeds.

It has been estimated that the SMU presently produces about 1% of the national vegetable seed requirement, 30% of the rice and 15% of the maize requirement. While the Unit is annually expanding its capacity there is still a large number of farmers storing traditional seed from the previous year as well as an important level of seed trade among farmers.

Table 58 shows that except for vegetables there was increased availability of improved seed between 1973 and 1974. This was especially true for rice seed. Of the 34,000 bags (160 lbs. average per bag) of rice seed available for distribution in 1974, however, 9,000 bags were not sold. This was because of the unpopularity of IR-5 due to the relatively poor performance of this variety compared to IR-20 which did better due to the poor rainfall distribution during the last production season. It has been reported that owing to good rains during the current production season IR-5 is doing as well (or slightly better) than IR-20,

TABLE 58: MINISTRY OF AGRICULTURE IMPROVED SEED SUPPLY (1973 and 1974)

| Seeds/Year | 1973 | 1974 |
|---|---|---|
| **Local Production** | | |
| MAIZE (in bags of 220-lbs/BAG) | 7,500 | 9,209 |
| RICE (in bags of 180-lbs. per bag) | 16,517 | 34,000 A/ |
| GROUNDNUTS (in bags of 80-lbs. per bag | 400 | 600 |
| **Imports and Local Production** | | |
| Vegetables (in ounces) B/ | 15,000 | 10,000 |
| Imports | 5,000 | 3,000 |
| Local | 10,000 | 7,000 |

SOURCE: Seed Multiplication Unit Records

A/ 9,000 bags not supplied and hence in storage to be supplied next year

B/ Reckoning period (Vegetable Year) is July of Year X to July of year X + 1. Vegetable seed distribution have only been important in the last two years. It used to be only a side line of the seed multiplication unit activity in previous years. There are several kinds of vegetables the most important being okro, pepper, tomatoes, onions, lettace and spinnach. The figure includes all of the assorted vegetables.

therefore it is anticipated that the former variety will be in strong demand for the forthcoming production year.

Table 59 shows the regional allocation of improved seeds distributed by the SSU. In addition to distributing improved seed to private farmers the Unit supplies seed to the State Farms and the Food Production Corporation. Emphasis is, however, on the private farmer. The SSU covers its variable costs for all improved seeds except maize but overall it has been estimated that the Unit is selling seeds at about 75% of cost if salaries, buildings and equipment are considered.

The distribution of improved seeds is under the direction of the Deputy Director of Agriculture in charge of Extension. He co-ordinates the distribution of improved seed with the Grains and Legumes Development Board,

Distribution within the region is in the hands of RACOM.

3. Agro-Chemicals.

The common agro-chemicals in use in Ghana are Agrocide, DDT, Lindane, Sevin and EDIBJ. The Ministry of Agriculture distributes these chemicals through to farmers Regional Agricultural Co-ordinators (RAC's) Particular attention is paid not only to chemicals for post harvest fumigation but also to pre-harvest chemicals which prevent field infestation.

4. Machinery and Equipment.

Most farm machinery in use in the country today is

TABLE 59: REGIONAL DISTRIBUTION OF IMPROVED SEEDS[A/]

| Region/Seed | Maize (bags of 220-lbs/bag) | Rice (bags of 160-lbs/bag) | Groundnuts (bags of 80-lbs/bag) | Vegetables (in Ounces) |
|---|---|---|---|---|
| **GREATER ACCRA** | | | | |
| ACCRA | - | - | - | 15,000 (10,000)C/ |
| **VOLTA** | | | | |
| HO | 1,200 (1,514) | - | - | |
| **CENTRAL** | | | | |
| WINNEBA | 2,300 (3,382) | - | - | |
| **ASHANTI** | | | | |
| KUMASI | 2,400 (1,413) | - | - | |
| **NORTHERN** | | | | |
| TAMALE | 1,600 (2,900) | 16,517 (34,000)B/ | 400 (600) | |
| TOTAL | 7,500 (9,209) | 16,517 (34,000) | 400 (600) | 15,000 (10,000) |

SOURCE: SEED MULTIPLICATION UNIT RECORDS

A/ These are the seed multiplication unit centres - Inter-regional requesitions and purchases could not be estimated; 1974 figures are in brackets.

B/ Intended to supply Northern and Upper Regions.

C/ Distribution to other areas from Accra.

owned and operated by private farmers and/or private contractors. Table 60 shows the machinery owned by the MOA and its regional distribution. Most of the machinery was in use in the Northern, Upper, Volta and Greater Accra Regions.

In order to make the maximum possible use of available machinery and equipments they are transported from areas where they are not in use to other areas where they are required. This involves a movement of equipment from the South to the North and vice-versa, which is possible owing to the difference in the growing seasons among regions. The foregoing makes it impossible to estimate accurately the number of machines in a region at any particular time.

5. Hand tools.

The commonest hand tools in use by farmers throughout the country are cutlasses and hand hoes. There have been shortages of both tools in recent years. The shortages have been attributed to a shortage of raw materials at the Tema Steel Works and also hoarding by traders to create artifical shortages in order to sell at inflated prices, or to smuggle tools to neighboring countries.

In an attempt to minimize these problems the MOA in collaboration with the factory at Tema and the Ministry of Trade and Industry has attempted to insure that adequate raw materials are imported for the manufacture of hand tools.

TABLE 60: MINISTRY OF AGRICULTURE MACHINERY DISTRIBUTION 1974

| Region/Machinery | TG.90 | BMT.60 Bulldozer | BMT.60 Standard | Wheeled Tractors | MF/165/ 135 D.B | Combine Harvestors | Universal Crawler Tractors | Universal Wheeled Tractors | T Total |
|---|---|---|---|---|---|---|---|---|---|
| Western/Central | 4 | 2 | 3 | 2 | 1 | - | 3 | 9 | 24 |
| Greater Accra | 5 | 3 | 5 | 6 | 1 | 1 | 4 | 7 | 32 |
| Eastern | 2 | 10 | - | 3 | 4 | - | - | 5 | 24 |
| Volta | 3 | 7 | 5 | 15 | 10 | - | 7 | - | 47 |
| Ashanti | - | 2 | 5 | 2 | - | - | - | - | 9 |
| Brong-Ahafo | 2 | 2 | - | 5 | - | - | - | - | 9 |
| Northern | 2 | 6 | 8 | 1 | - | 46 | - | - | 63 |
| Upper | 1 | 6 | 1 | 10 | - | 13 | - | - | 31 |
| TOTAL | 19 | 38 | 27 | 44 | 16 | 60 | 14 | 21 | 239 |

The sale of hand tools is by private distributors (GMEC, UFC and G.B. Ollivant), supplemented by sales through District Extension Officers of the Ministry of Agriculture.

6. Agricultural Credit.

Commercial Banking System. Given the importance of agriculture and the well developed physical infrastructure of Ghana's commercial banking system one would expect to find the commercial banks significantly involved in extending credit to agriculture. 1/ In fact, however, this is not the case. Examining the allocation of commercial bank loans and advances from 1967 to 1973 one sees that in 1973 agriculture, forestry and fishing received only 6.8 percent of all loans and advances, up from only 3.34 percent in 1968. Within these small percentages forestry no doubt received the largest proportion leaving very little for agriculture. Over this period commerce (imports) and manufacturing received the greatest share of attention from the commercial banking system. Even services, which accounts for only a small percent of Ghana's Gross Domestic Product, received a larger share than agriculture of commercial bank credit from 1967 to 1973.

1/ As of June 1973 the three commercial banks operating in Ghana had some 185 offices spread over the country.

TABLE 61: [redacted]

(Millions of Cedis)

| | TOTAL LOANS AND ADVANCES | AGRICULTURE FORESTRY AND FISHING | MINING AND QUARRYING | MANUFACTURING | BUILDING AND CONSTRUCTION | ELECTRICITY WATER GAS | COMMERCE | | TRANSPORT STORAGE AND COMMUNICATIONS | SERVICES | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | COCOA MARKETING | OTHER | | | |
| 1967 Amount | 1,181.9 | 77.0 | 13.4 | 167.8 | 143.3 | 2.3 | 169.9 | 294.7 | 20.3 | [illegible] | 125.3 |
| Percent of Total | 100.0 | 6.51 | 1.13 | 14.19 | 12.12 | 00.19 | 14.37 | 24.93 | 1.71 | 14.42 | 10.6[illegible] |
| 1968 Amount | 1,194.3 | 39.9 | 20.4 | 215.5 | 158.3 | 5.1 | 177.0 | 287.2 | 19.7 | 166.6 | 108.7 |
| Percent of Total | 100.0 | 3.34 | 1.70 | 18.04 | 13.25 | 00.42 | 14.82 | 24.04 | 1.65 | 13.[illegible] | 9.10 |
| 1969 Amount | 1,555.6 | 81.6 | 42.2 | 381.6 | 191.9 | 9.9 | 152.8 | 317.4 | 27.6 | 213.3 | 137.1 |
| Percent of Total | 100.0 | 5.24 | 2.71 | 24.53 | 12.33 | 00.63 | 9.82 | 20.40 | 1.77 | 13.71 | 8.81 |
| 1970 Amount | 1,878.3 | 111.9 | 56.5 | 507.5 | 184.8 | 14.0 | [illegible] | 504.2 | 62.6 | 245.4 | 116.6 |
| Percent of Total | 100.0 | 5.95 | 3.00 | 27.02 | 9.83 | 00.74 | 3.05 | 26.84 | 3.33 | 13.06 | 6.20 |
| 1971 Amount | 2,739.3 | 154.9 | 74.5 | 871.3 | 237.5 | [illegible] | [illegible] | 831.6 | 87.4 | 310.4 | 123.1 |
| Percent of Total | 100.0 | 5.65 | 2.71 | 31.80 | 8.30 | 00.66 | 1.38 | 30.35 | 3.19 | 11.33 | 4.49 |
| 1972 Amount | 3,143.8 | 182.1 | 78.4 | 1,052.3 | 260.6 | 21.1 | 22.3 | 945.8 | 117.4 | 372.1 | 92.7 |
| Percent of Total | 100.00 | 5.79 | 2.49 | 33.47 | 8.29 | 00.67 | 00.71 | 30.09 | 3.73 | 11.80 | 2.95 |
| 1973 Amount | 3,187.0 | 216.6 | 31.3 | 926.0 | 335.4 | 16.7 | 35.3 | 1,032.4 | 203.2 | 311.9 | 78.1 |
| | | 6.80 | .98 | 29.06 | 10.52 | .52 | 1.11 | 32.39 | 6.38 | 9.79 | 2.45 |

Sources: Bank of Ghana — Report of the Board (various years)
Bank of Ghana — Quarterly Economic Bulletin — July - September 1973
Bank of Ghana — Quarterly Economic Bulletin — October - December 1973

A part of the answer lies in the history of commercial banking in Ghana. Commercial banks were first established to meet the needs of importers, exporters and traders for short term credit. Given the colonial status of the Ghanaian economy at that time they were no doubt meeting the most significant needs of the economy with respect to credit. Over time however the economy has evolved and itsrequirements for credit have changed away from short term commercial financing toward long term investment credits. While it would be unfair to say that the commercial banking system has failed to adapt to changing needs, the system has failed to adapt as rapidly as might be desired. Taken as a whole, the banking system continues to focus upon short term commercial credits and to devote only limited attention to financing long term investments. This is due in large part to the fact that short term credits are profitable, relatively risk free and the area in which the banking system is most experienced. Compared to present credit requirements, the commercial banking system is poorly equipped to meet the needs of/ long term investments in agricultural or other subsectors. The system lacks the experience and type of personnel required to evaluate long term investment proposals for financial

viability and economic feasibility.

Another problem facing the Commercial Banking System is the structure of Ghanaian agriculture. The vast majority of producers are small holders who are difficult to provide with credit. For small holders the risks are large and the administrative costs of making loans is high in relation to the value of the loan. Also the willingness, though not necessarily the ability, of small holders to pay interest is low. As a result the limited amount of credit disbursed by commercial banks to agriculture tends to flow to the larger farmers.

The Government of Ghana is aware of the needs for agricultural credit and has attempted to encourage the commercial banking system through a system of guidelines and moral suasion to provide more agricultural credit. In general, these guidelines have not been successful in directing credit toward agriculture and other priority sectors. The ability of the Bank of Ghana to enforce compliance is limited and the commercial banks are constrained by the 6 percent ceiling on loans to agriculture. With the maximum rate of interest set at such a low level even a credit guarantee program, such as the Bank of Ghana administers for commercial bank loans to agriculture, does not make agricultural lending attractive for the commercial banking system.

Agricultural Credit Bank.[1/] The Agricultural Development Bank (ADB) was established in 1965 as the Agricultural Credit and Cooperative Bank.[*2/] Since 1965, the A.D.B. has grown into an institution with twelve branch offices (at least one in every region) and eight Farm Credit Service Offices. The latter assist prospective clients in completing their loan applications, and supervise the loans and their collection. Loans of up to ¢5,000 may be approved at the branch level. Loans of a larger amount must be approved by the head office or the Board of Directors (the latter for loans exceeding ¢20,000).

Table 62 provides data on the volume of formal credit to agriculture in Ghana in recent years. As already noted most of this credit goes to large scale farms and agro-industries. Lending to small farmers has been, almost exclusively the province of the A.D.B.

The A.D.B. has had a number of problems in making credit available to small holders. First, the costs of administering and collecting such loans is high relative to their value. Second, the risks of making loans

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1/ See Joseph B. Goodwin and Roger Selley "A Review of Small Farmers Credit in Ghana: The Rice and Maize Schemes of the Agricultural Development Bank, In Small Farmer Credit in Africa. A.I.D. Spring Review of Small Farmer Credit, Country Papers, AID Washington, 1973

*2/ Its name was changed to the present form in 1967.

Table 62: LOANS AND ADVANCES TO THE AGRICULTURAL SECTOR 1962 - 73 (1,000 Cedis)

| SOURCE | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Commercial Banks | 2,500 | 18,100 | 7,000 | 10,000 | 13,800 | 3,200 | 3,800 | 10,000 | 9,048 | 16,154 | 16,048 | 17,300* |
| National Investment Bank | - | 750 | 224 | 290 | 405 | 353 | 1,233 | 769 | 692 | 3,433 | 7,583 | 4,112 |
| Agricultural Development Bank | - | - | - | - | 1,071 | 392 | 1,215 | 3,070 | 4,530 | 8,622 | 28,469 | 17,823 |
| Total | 2,500 | 18,850 | 7,224 | 10,290 | 15,276 | 3,945 | 6,248 | 13,839 | 14270 | 28,209 | 52,100 | 39,235 |

Source:- Loans and advances outstanding December 31, Bank of Ghana Annual Report for the various years.

* Loans and advances for the period July 1972 - June 1973, Bank of Ghana Annual Report 1973.

is high because land cannot be used as collateral. [1]

In an effort to overcome these problems the Bank has introduced a group/cooperative credit scheme for small scale rice and maize farmers. Under this scheme the Bank makes loans to groups of farmers who meet certain defined standards. In lending to such groups the cost of making the loan (relative to the amount borrowed) is reduced. The risk element is also reduced through the requirement that all members of the group repay their loan before a y member of the group can receive another loan. Social pressure is thus utilized to assist repayment. Also, in an effort to assist farmers in increasing yields and income, and hence their ability to repay, the adoption of an improved technical "package" (seed, fertilizer etc) is required of the groups.

With respect to small scale maize farmers the available evidence (Table 63 ) would tend to suggest that the scheme has been increasingly successful in securing repayment. Additional improvement in repayment performance is a requisite if the Bank is to move toward financial viability.

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1/ Given the land tenure system the holder does not own the land but rather simply has, through lease or grant, a right to its use. In the case of loans for equipment the equipment itself can be used as collateral. Otherwise, crops can be used as collateral.

Table 63: LOAN DISBURSEMENT AND REPAYMENT FOR THE MAIZE GROUP FARMING SCHEME 1969 - 73 (Q)

| | 1969 | 1970 | 1969-71 | 1970-1972 | 1969-1972 |
|---|---|---|---|---|---|
| Loan Disbursement | 61,210 | 405,057 | 1,415,086 | 2,045,871 | 3,971,112 |
| Loan Repayment | 55,895 | 201,895 | 850,117 | 1,830,392 | 3,358,265 |
| Arrears | 5,315 | 203,162 | 565,969 | 215,479 | 612,847 |
| % Repayment | 91% | 49% | 60.1% | 89.5% | 84.5% |

The provision of credit to groups of small-scale maize and rice farmers is only one portion of the ADB's lending activity. It also makes loans in support of industrial crops, other food crops, livestock production, fishing and agro-business activities. Table 64 provides a brief breakdown of the Bank's lending activities in recent years.

Perhaps the major problem faced by the Bank lies in the Government imposed ceiling of 6 percent as the rate of interest to be charged on loans to the agricultural sector (under-valued interest rate). While the Bank's costs as a percent of loans outstanding have dropped below this level in recent years the Bank's losses due to uncollected loans probably render the Bank financially unviable at this interest rate. The Bank is, therefore, dependent on injections of outside capital. The inability of the Bank to charge higher rates of interest reflecting varying risks and costs also presents a problem, as does the ceiling of 3½ on the rate of interest it may pay on deposits (which is below that paid by other institutions).

Other problems of an administrative nature have hindered the operation of theBank. Among these are: 1) lack of an effective system of loan recording, 2) failure to approve loans in a timely fashion, and 3) problems of repayment scheduling and security.

In addition to these internal problems, there are problems at the farm level which increase the difficulty of providing credit to agriculture in general and smallholders in particular. These include 1) lack of knowledge of present production systems 2) problems in the delivery of requisite inputs and 3) problems of transportation and marketing. Unless these are overcome the provision of credit alone will not insure increased production, and incomes for smallholders.

Table 64: **AGRICULTURAL DEVELOPMENT BANK LOANS APPROVED: ALL LOANS, FOOD CROPS LOANS, RICE AND MAIZE LOANS ¢ 000**

| | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|
| Total A.D.B. Loans | 5,070.2 | 4,529.7 | 8,622.4 | 29,469.0 | 17,823.3 |
| Food Crops Loans | 813.8 | 1,871.9 | 2,874.5 | 11,128.1 | 8,364.3 |
| Rice Loans 1/ | 477.0 | 810.2 | 1,008.8 | 2,059.2 | 2,892.9 |
| As % Total | 15.5 | 17.9 | 11.7 | 7.23 | 16.23 |
| As % Food Crops | 58.6 | 43.3 | 35.0 | 18.49 | 34.59 |
| Maize Loans | 250.0 | 373.4 | 1,249.4 | 939.6 | 1,617.1 |
| As % Total | 7.5 | 8.2 | 14.5 | 3.30 | 9.07 |
| As % Food Crops | 28.3 | 19.9 | 43.5 | 8.44 | 19.33 |

1/ Includes loans to individuals as well as to group and co-operatives in the Northern and Upper Regions

Source: A.D.B. records

Note: The above comparison is for loans approved and does not represent actual disbursement

Table 65: [illegible] LOANS OUTSTANDING AND INVESTMENT AND OPERATING EXPENDITURE

| | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|---|
| [illegible] Outstanding ([illegible],000) | 1,484.3 | 2,140.4 | 3,424.3 | 5,888.3 | 10,650.9 | 24,277.8 | 38,323.4 |
| [illegible] Loans Outstanding ([illegible]) | 1,312.9 | 1,812.4 | 2,782.4 | 4,656.3 | 8,269.6 | 17,464.3 | 31,300.6 |
| [illegible] of Fixed Assets (₦1,000) | 71.6 | 98.0 | 145.3 | 125.6 | 144.0 | 265.3 | 534.6 |
| [illegible] | 147.1 | 238.6 | 379.7 | 473.2 | 572.3 | 1,000.2 | 1,672.9 |
| [illegible] Salaries | 86.0 | 140.2 | 209.8 | 260.8 | 311.8 | 398.9 | 609.6 |
| [illegible] Expenses | 44.4 | 73.7 | 125.4 | 165.6 | 201.4 | 522.7 | 924.7 |
| [illegible] Depreciation | 16.7 | 24.7 | 44.5 | 46.8 | 59.1 | 78.5 | 138.6 |
| 5. Salaries and Operating Expenses as % are Loans Outstanding | 9.9 | 11.8 | 12.0 | 9.2 | 6.2 | 5.3 | 4.9 |
| 6. Total Expenses as % are Loans Outstanding | 11.2 | 13.2 | 13.6 | 10.2 | 6.9 | 5.7 | 5.3 |

Table 66: **N.I.B. Agricultural Credit - 1970 - June 1974**

| | Greater Accra Sector | | | | Southern Sector | | | | Northern Sector | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Livestock | Food Crops | Tree Crops | Agro-business | Livestock | Food Crops | Tree crops | Agro-business | Livestock | Food crops | Tree crops | Agro-business | Total |
| 1970 | 51,471.39 | - | - | - | 91,840.00 | - | - | - | 215,430.00 | 124,480.00 | 95,000.00 | - | 578,221.39 |
| 1971 | 187,600.00 | 37,440 | - | - | 42,456.90 | 89,800 | - | - | 77,000.00 | 160,640.00 | - | - | 594,936.90 |
| 1972 | 120,190.00 | - | - | 500,000 | 13,620.00 | 250,000 | 4,864,000 | - | - | 1,382,130.00 | - | - | 7,129,940.00 |
| 1973 | 20,000.00 | - | - | - | 52,052.00 | - | - | 17,840.00 | 187,090.00 | 941,820.00 | - | - | 1,218,742.00 |
| 1974 | - | - | - | - | - | 126,510 | 2,124,220 | 37,446.80 | - | 953,200.00 | - | - | 3,241,456.80 |
| | 379,261.39 | 37,440 | - | 500,000 | 199,968.90 | 466,310 | 6,988,220 | 55,286.80 | 479,480.00 | 3,562,330.00 | 95,000.00 | - | 12,763,297.89 |

**Notes**

Areas of Operation: The Accra Sector covers Greater Accra Administrative Region.

The Southern covers the Eastern, Western, Central and Volta regions.

The Northern covers the Ashanti, Brong Ahafo, Northern and Upper Regions.

# I. PRODUCT MARKETING

## 1. The Importance of Marketing For the Small-scale Farmer

Market surveys[1/] indicate that relatively small proportions of total production are consumed on small-scale holdings. For example in two villages surveyed in the guinnean savanna belt, farmers cultivated an average of 6 acres under a variety of food crops. It was estimated that farmers marketed an equivalent of 4 acres or about two-thirds of total production. Major marketing difficulties, in order of importance, were reported to have been:

1) inadequate transport facilities;
2) inadequate storage and crop losses;
3) lack of credit to hold inventories;
4) price fluctuations (low harvest-time prices).

The 1970 Agricultural Sample Census provides additional evidence that small-scale farmers market considerable portions of their total production. The table below is illustrative.

TABLE 67: DISTRIBUTION OF HOLDINGS BY SIZE AND QUANTITY SOLD, 1970

| Size of Holding Acres | Producing Only for Subsistence Number | % | Selling less than 50% of Production Number | % | Selling more than 50% of Production Number | % | Total Number |
|---|---|---|---|---|---|---|---|
| 0-3.9 | 81,103 | 18.3 | 188,305 | 42.5 | 173,892 | 39.2 | 443,300 |
| 4-9.9 | 25,553 | 11.5 | 78,219 | 35.4 | 117,276 | 53.1 | 221,048 |
| 10+ | 4,444 | 3.2 | 23,176 | 16.4 | 113,232 | 80.4 | 140,852 |
| Total .. | 111,100 | 14.0 | 289,700 | 36.0 | 404,400 | 50.0 | 805,200 |

1/ For example, see V.K. Nyanteng and G.I. van Apeldoom in "Some Development Implications of Farmer's Problems in Marketing their Food Crops" Legon, 1970.

Of all farmers cultivating between 0 and 3.9 acres more than twice as many produced mainly for sale than for subsistence only. Smallholders (farmers cultivating 0 - 9.9 acres) explain 72 % of the total number of holdings selling more than 50 % of their production. The proportion of farmers cultivating 0 - 3.9 acres and producing only for subsistence varies regionally. In the Volta Region 100 % of these farmers with less than 3.9 acres produce only for subsistence. In the Northern and Upper Regions only 53 % and 65 % of these farmers, respectively, produce for subsistence.

Transport costs make up a large part of total marketing costs in Ghana, Transport costs generally vary inversely with volumes and distances marketed. It follows that since a significant proportion of total marketed production originates from small-scale holdings a sizeable burden is placed on the marketing system to efficiently move produce from producer to consumer.

2. Structural Characteristics

a) Private Sector

The private marketing system inGhana is complex and comprised of various channels. These are differentiated by their location and not by the buyer and sellers who participate in these channels. A typical farmer may sell his/her produce either on the farm, on the roadside, at local feeder markets and to a lesser extent at major rural and urban wholesale, assembly and terminal markets. Feeder markets or rural markets may be differentiated from wholesale and terminal markets in that a small proportion of total volume marketed at the former is sold retail. The produce is transported from farm to feeder markets in headloads

and commonly by females. Farmers' wives are the major sellers in these markets and the bulk of produce is purchased also by female traders, who purchase in bulk and transport produce by lorry to wholesale markets.

The location of rural markets is largely determined by proximity to rural road junctions. New roads have created new markets. In the north, markets are frequently held on one or two predetermined week-days. In the south, market days generally extend throughout the week. Rural markets generate the bulk of tax revenues for local councils. Taxes are levied on sellers. Other than private traders, the Food Distribution Corporation, the Grains and Legumes Development Board and the Secretary Receivers of the Cocoa Marketing Board are important buyers in rural markets; these public institutions also maintain buffer stocks to stabilise prices.

Trading in wholesale markets in the north is dominated by males whereas in the southern wholesale markets females control trading. In the major assembly or terminal markets in the urban areas women food retailers are organized in commodity associations. Members of these associations vest the responsibility and authority for the negotiations of quantities and prices for wholesalers or traders to an elected president called "the queen." The queen allocates produce among retailers (largely petty traders) as well as permission or rights to new retailers.

# CHAPTER V - REGIONAL FEATURES OF AGRICULTURAL PRODUCTION

b) Public Sector

It has frequently been argued that the private trading system, dominated by females, is antiquated and not economic. Consequently, various public sector marketing programs have been organised and implemented by various public institutions.

A minimum guaranteed price scheme for maize has been in effect since 1968-69. When open market prices fall below guaranteed prices the Food Distribution Corporation is obliged to purchase produce at the guaranteed price to support market prices. During the 1974 harvest, maize "surpluses" have been realised in some parts of the country where open market prices have been below guaranteed prices; there are reports that the Food Distribution Corporation and Grains Development Board, due to lack of storage space, and funds has purchased only about 3,000 tons of maize during the current harvest season.[1/]

In March 1969, a guaranteed minimum price (farm gate) was announced for rice and set at N$7.50 for a 180-pound bag of paddy. This has been gradually increased to the current price of ₵14.50. Other current guaranteed minimum prices have been raised for maize (₵14.00 per 220-lb) and cotton (35 pesewas per pound). The current guaranteed price for cocoa is ₵15.00 per load of 60 lbs.

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1/ The Food Distribution Corporation and theGrains and Legumes Development Board are presently carrying about 23,000 tons of the 1973 maize crop, as a buffer stock.

3. Conduct and Performance

An important determinant of a well-functioning agricultural marketing system is the quantity of agricultural production available for sale in relation to effective demand. If agricultural production exceeds demand at high guaranteed minimum prices, the pressures on the marketing system to clear surpluses are high. If production is below demand the marketing system is usually blamed on grounds of inefficiency and excessive profits. InGhana, as in other countries, it is likely that marketing costs reflect charges related to freight, handling, storage, processing and a sufficient profit to reward middlemen for risks and expertise involved in undertaking these functions. The greater the market imperfections, the greater the risks and costs and, therefore, the higher the margins.

In overcoming market imperfections in the traditional marketing system the GCG has primarily relied on a strategy of direct participation in the market in competition with the private channels. It is not possible to determine whether this strategy has added ___, another market imperfection or whether Government agencies are more efficient than private traders. It is likely that a strategy of tackling the major physical problems underlying market imperfections may be equally as important as a strategy of direct government intervention in the agricultural marketing system. Some important marketing constraints which need to be corrected in Ghana include:

i) Feeder Roads and Transport

The deteriorating condition of many roads, the inadequate feeder road network and an aging vehicle fleet have several adverse effects on agricultural marketing. First, they cause erratic commodity flows and frequent seasonal scarcities. Second, they cause high transport costs. Estimates of per ton mile costs on bad feeder roads range from 20 pesewas to 80 pesewas compared to estimates of 9 pesewas to 9.5 on primary roads. Third, they give rise to a number of risks and uncertainties which are undoubtedly to be reflected in marketing margins. The effects of the inadequate road network have been recognized by the Ghanaian Government and plans are underway to considerably expand this network during the next five-year development plan period. The problem will be to find an appropriate implementation mechanism and to assure proper maintainance over time.

ii) Storage and Losses

The nature and magnitude of storage and loss problems vary for different crops in different areas. Most seriously affected by loss are starches (about 25 % of total production). Moisture control of cereals constitute problems of on-farm storage in the south. Insect problems are common in storage of grain legumes. More detailed study is necessary to determine at what stage storage improvements are to be made, either on-farm or off-farm (primary, assembly or terminal) and through which financial mechanism private channels may be encouraged to build storage facilities.

iii) Market Information and Standardisation

Inadequate market information and lack of standardization are important means for traders to pass on risk and uncertainties to consumers or producers. Improvements, however, cannot be made in isolation of other components of an overall marketing system. Market information is presently compiled by the Economics and Marketing Division of the Ministry of Agriculture. We are not able to determine how rapidly and effectively this is disseminated to farmers, consumers and traders.

iv) Pricing Policies

The relationship between a well-functioning marketing system and the volume of total agricultural production has already been noted. This relationship is also affected by the pricing policies of public institutions. A common example is cocoa. Producer prices, adjusted for the value of input subsidies are a small fraction (less than 30 %) of world market prices. It is frequently argued that guaranteed minimum prices (farm gate) for rice and maize are also below comparable world market prices. For these crops it is difficult to substantiate or accept this when one adjusts (increases) producer prices by the value of heavy input subsidies. These include an 85 % fertiliser subsidy, an over-valued exchange rate which lowers the real cost of imported capital equipment and subsidised interest rates considerably below the financial and opportunity costs of money and capital.

The effects of pricing policies primarily affect production costs and favor large-scale production units. An important, and frequently ignored, short-term effect of this is that large-scale production units

cause abrupt short run increases in volumes of marketed production in given localities. This puts pressure on the marketing system to clear local surpluses. If they are not cleared rapidly incomes of small-scale production units are adversely affected. The ability of the marketing system to clear surpluses rapidly is dependent on volume of working capital, storage facilities, and the quality of roads and of the vehicle fleet. Without these improvements the marketing system cannot function effectively. Without an effective marketing system the goals of self-sufficiency will be difficult to achieve, particularly when current price policies favor large-scale production units and disadvantage small-scale producers. Only when the volume of marketed production is relatively stable can prices be stable. A program to stabilize market prices will give small holders greater incentive to increase total production and their marketable surplus.

v) Agricultural Prices

Table 68 shows the increase in national average wholesale prices for the periods 1963-71 and 1971-73. The percentage increases for all commodities over the 1963-71 period ranges from 29 % for cowpeas to 129 % for cocoyams. Wholesale prices of starches have increased more than prices of cereals. During the 1971-73 period, however, annual wholesale prices have increased much more rapidly than during the preceding period. The largest increases were recorded for the following important local food items:

| | | | |
|---|---|---|---|
| tomatoes | - | 43%/year ) | |
| garden-eggs | - | 38%/year ) | |
| dried pepper | - | 32%/year ) | most perishable |
| cocoyams | - | 30%/year ) | |
| bananas | - | 27%/year ) | |
| local rice | - | 24%/year | |
| millet | - | 18%/year | |
| maize | - | 15%/year | |

Table 69 shows the degree of price variations within years by regions. Within year price variations in 1973 were greatest in the Northern, Ashanti and Upper Regions. Average wholesale prices of all products in the months before harvests were almost double those prevailing in the lowest price months, usually 3 months after harvests. Table 69 also gives some evidence that price variations within years have become more pronounced each year since 1963. There is also some evidence that within year variations are greater during bad harvest years (1972) and lower during good harvest years (1970).

The increase in wholesale market prices indicates that marketed production has not kept pace with increases in demand. However, the extreme and worsening within year price fluctuations indicate that the marketing system has not performed well. The need for an improved performance of the marketing system is perhaps the most important factor to reducing intra year price variations and, therefore, increasing overall agricultural production.

TABLE 68: WHOLESALE PRICE CHANGES OF SELECTED COMMODITIES

| Commodities | Percentage Change 1963 - 1971 | Percentage Change 1971 - 1973 |
|---|---|---|
| Maize (220 lbs.) | 90 | 46 |
| Millet (204 lbs.) | 59 | 55 |
| Sorghum (204 lbs.) | 85 | 38 |
| Local rice (240 lbs.) | 57 | 72 |
| Yams (100 tubers) | 99 | 32 |
| Cocoyams (120 lbs.) | 108 | 28 |
| Plantain (bunch) | - | 39 |
| Groundnuts (180 lbs.) | 80 | 57 |
| Cowpeas (220 lbs.) | 29 | 20 |
| Oranges (100 singles) | - | 30 |
| Bananas (bunch) | - | 81 |
| Tomato (beer case) | 67 | 131 |
| Dried pepper (cocoa bag) | 41 | 98 |
| Garden eggs (rice bag) | 71 | 115 |
| Palm oil (kerosine tin) | 70 | 95 |
| Palm kernel oil (kerosine tin) | 48 | 82 |
| Coconut oil (kerosine tin) | 55 | 74 |

Source: Computed from Ministry of Agriculture National Average Wholesale Commodity Prices (1963-1973).

TABLE 69: MEASURE OF FOOD PRICE FLUCTUATIONS AT MAJOR URBAN MARKETS 1/

| Major Urban Markets | Region of Location | Year | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1963 | 1968 | 1970 | 1971 | 1972 | 1973 |
| Sekondi/Takoradi | Western | | | | | | 1.56 |
| Cape Coast | Central | | | | | | NA |
| Koforidua | Eastern | 1.42 | 1.53 | 1.45 | 1.57 | NA | 1.70 |
| Ho | Volta | | | | | | 1.54 |
| Accra | G/Accra | 1.49 | 1.55 | 1.27 | 1.56 | 1.95 | 1.74 |
| Kumasi | Ashanti | | | | | | 1.83 |
| Sunyani | B/Ahafo | | | | | | 1.40 |
| Tamale | Northern | | | | | | 1.93 |
| Bolgatanga | Upper | | | | | | 1.76 |

Source: Computed from Ministry of Agriculture wholesale Price Data.

1/ These numbers are derived by dividing average low month prices of 18 staples into average high months prices.

# CHAPTER IV - AGRICULTURAL AND RELATED INSTITUTIONS

## IV. AGRICULTURAL AND RELATED INSTITUTIONS

### A. Ministry of Agriculture.

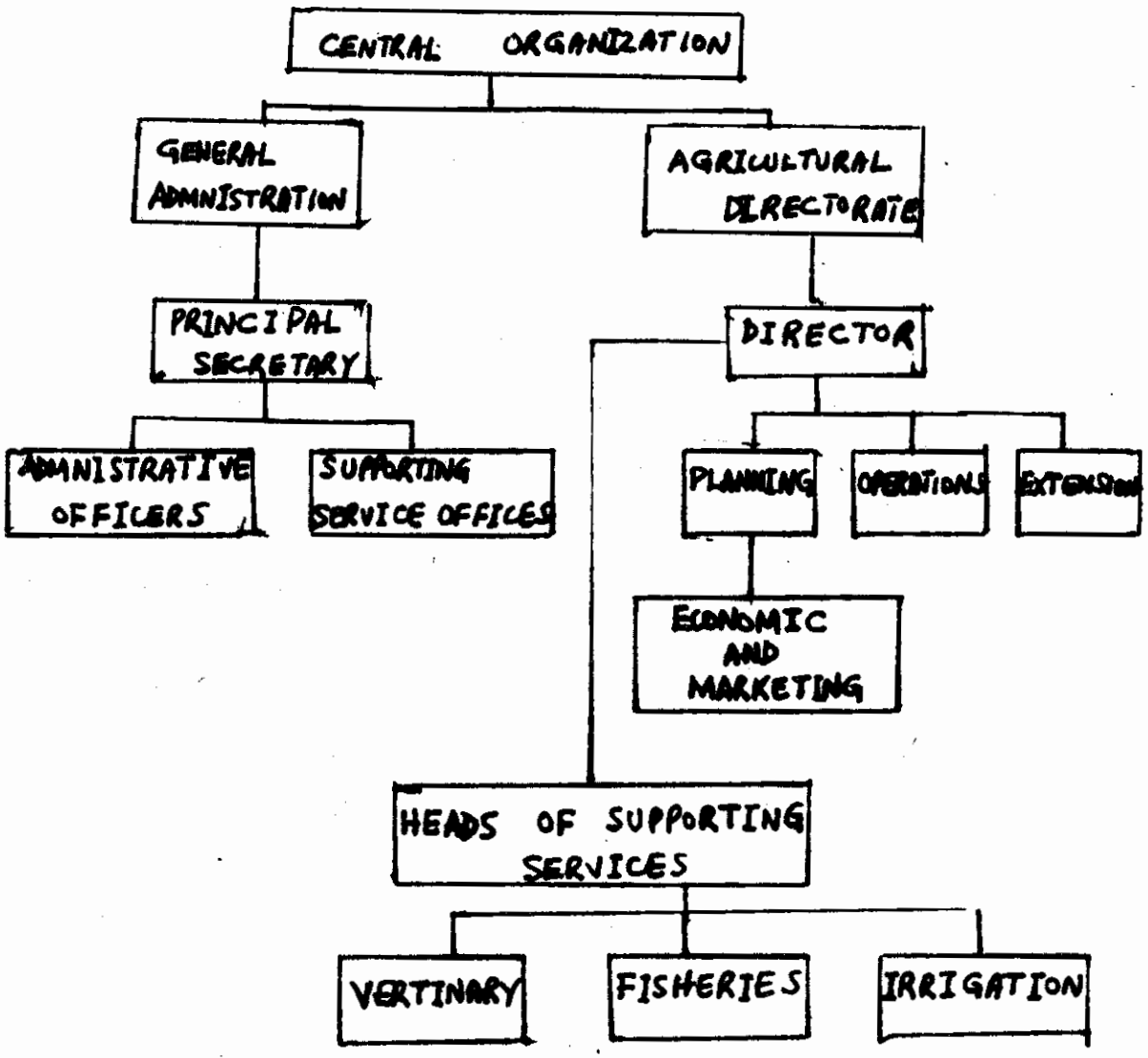
The main responsibilities of the Ministry of Agriculture are to (1) initiate policies designed to increase the production of food crops and raw materials for domestic industry, 2) to diversify and increase agricultural exports as a means of easing the foreign exchange constraint on the economy; and 3) provide technical and professional supervision for programmes aimed at developing the agricultural resources of the country. In order to achieve these objectives the Ministry was again re-organised in 1972 to ensure that small-scale farmers and fishermen who produce the bulk of the food consumed in the country are adequately provided with the support they require.

1. Central Organisation. The Central Organisation of the MOA consists of the Office of General Administration and the Agricultural Directorate. The General Administration Office and the Directorate which formerly operated together under the title General Administration have been separated as a step to creating the Department of Agriculture as distinct from the Ministry (administration). The Office of General Administration is made up of the Office of the Principal Secretary supported by a team of administrative officers and offices of other supporting services (Veterinary, Fisheries and Irrigation). It is responsible for all administrative matters including relations with other ministries and international organizations. It is also responsible for organizational as well as financial matters concerning the boards and corporations under the Ministry.

The Agricultural Directorate is headed by the Director of Agriculture. He is assisted by three deputies in charge of Planning, Operations and Extension. The heads of the supporting services - Veterinary, Fisheries and Irrigation are also posted to the director's office. The Director of Agriculture is responsible for all professional matters. The Veterinary, Fisheries and Irrigation Services and Economic and Marketing Division (which comes under Planning) provide specialist support for the ExtensionDivision. The Office of the Director and that of the Principal Secretary initiate policies on agriculture and coordinate various activities aimed at providing for professional and technical supervision of agricultural programmes in the country. The Director liaises with institutions, ministries and international organisations on professional matters. On the following page is an organisational chart of the Central Organisation of the Ministry of Agriculture

2. Regional Organization. The Assistant Directors of Agriculture are currently responsible for all MOA activities in the nine regions of the country. They initiate programmes and provide technical advice and direct services to farmers through extension officers who are distributed throughout the 40 agricultural extension districts and 560 sub-districts into which the country is divided. The transfer of a large number of extension staff to the regions from the headquarters has augmented the regional staff. However, the staffing position in the districts and sub-districts is still inadequate and an effort is being made to recruit more professional and technical officers to the regions.

CHART 1 ORGANIZATION OF MINISTRY OF AGRICULTURE




SOURCE : MINISTRY OF AGRICULTURE

For a detailed report of the organisation of the Ministry of Agriculture including the current manpower structure and future requirements the reader is referred to a report by M.O. Watkins and Horatio Mends, Manpower and Training Requirements of the Ministry of Agriculture, MOA, Accra, December 1973.

B. Quasi-Public Agricultural Institutions.

The Ministry of Agriculture is responsible for various commodity boards and corporations. The Principal Secretary of the MOA is in charge of the organisational and financial matters concerning these boards and corporations. The corporations and boards under the Ministry's control are:

- State Farms Corporation
- Food Distribution Corporation
- Food Production Corporation
- State Fishing Corporation
- Bast Fibre Development Board
- Grains and Legumes Development Board
- Cotton Development Board
- Ghana Tobacco Company, Ltd.
- Pomadze Enterprises

The Assessment Team has collected information about the above boards and corporations including objectives, operations and output. Time did not permit us to complete this, However, it is anticipated that this information will be prepared in the near future as an appendix to this report.

C. Research Institutions

There are two important features of the overall agricultural research effort in Ghana. First, there is no overall umbrella organisation under which research of various institutions is coordinated. Second, the Ministry of Agriculture in general and its extension network in particular have little if any effective communication with the research community.

There are two councils administratively responsible for all research undertaken in Ghana. There exists no mechanism to affect effective coordination between them. The first is National Council for Higher Education (NCHE) established by an NRC decree in December 1972. The Council is budgeted under the General Administration and has the responsibility of advising the Government on the development and functioning of institutions of higher learning. The following institutions which are engaged in agricultural training and research are responsible to it:

1. University of Ghana at Legon
2. University of Science and Technology at Kumasi
3. University of Cape Coast.
4. Institute of Statistical, Social and Economic Research
5. Volta Basin Research Programme
6. University Research Stations of which the most important are at Kade, Kpong and Nungua

The second Council, budgeted under the Ministry of Economic Planning, is the Council for Scientific and Industrial Research (CSIR). It contains numerous institutes. For agriculture the most important are:

1. Crop Research Institute
2. Animal Research Institute
3. Soil Research Institute
4. Food Research Institute
5. Institute of Standards and Industrial Research
6. Water Resources Research Unit
7. Forest Products Research Institute.

For fiscal year 1974/75, NCHF was budgeted ¢25.2 million and CSIR was budgeted ¢5.3 million.

The focus of these institutions is on sophisticated basic research with the result that little applied research which could have direct and immediate relevance to the majority of Ghana's farmers is undertaken. The reasons for this are difficult to isolate, but they stem from the lack of effective communication between extension officers and research personnel.[1/]

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1/ See "Symposium on Crop Research and Extension For A Greater Ghana", held at UST Kumasi in 1971.

There is some coordination between the MOA, domestic research institutes, and international research institutes like WARDA, IITA and IRRI. However, communication is based on specific subjects and among a few indivuduals rather than on an integrated long-term multi-disciplinary institution-wide basis.

Most of the training of agriculturists is undertaken at the Colleges of Agriculture at Kumasi and Legon from which about 15 - 20 agronomists are graduated each year. Some receive training overseas and return to various institutes. Some observers[1/] have commented that once at post, most qualified men "were no longer producing the quantity and quality of work of which we believe them capable, a situation for which they themselves may not be responsible." Also scientists apparently are not willing to discuss work" which they believe to infringe another man's responsibility." Frequently, scientists are not aware of the work done by others in important related fields. For example, there appears to be little coordination even between the institutes of CSIR, with the result that agronomic trials are not linked to soil survey and classification programs. Also, agronomic trial programes focusing on pure stand trials mainly on grains are not linked to the realities of inter-cropping on small-scale holdings. It is likely, however, that the need for more applied work has not been sufficiently dramatised by extension workers

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1/ M.Cox and C. Breitenbach. "Proposal for Developing Grain Research Station at Nyankpala, Northern Ghana," February 1972.

who ostensibly are most attuned to farmers problems and needs.

It appears that agricultural research is generally not lacking physical and budgetary resources. There is sufficient land on various research stations, and laboratories are relatively well equipped. CSIR alone, whose institutes are predominantly engaged in agricultural research, has been budgeted 25% of the total capital expenditures budgeted to the Ministry of Agriculture in FY1974/75. However, there is not sufficient manpower to effectively utilize these physical and budgetary resources. For example, Ripley[1/] reported that in 1967, there were 147 agricultural research workers in Ghana. This number declined to 124 in 1971.[2/]

According to Wardy,[3/] in 1973 there were 175 researchers engaged in agricultural research including forestry and cocoa. This figure did not, however, include social science researchers who are primarily at ISSER.

In relation to the diversity of ecological zones, cropping pattern technological systems, rotational systems, etc. this number of researchers is critically small. Given the amount of applied research being done among these, the situation is worse. This points to be need for a well-planned and coordinated applied research/extension program.

1/ F.C. Ripley. "Coordination of Agricultural Research in Ghana." MOA, 1968.

2/ "Symposium onCrop Research and Extension for a Greater Ghana" held at UST, Kumasi in 1971.

3/ J.F.A.Wardy. Directory of Scientific Research in Ghana. Kumasi University Press, 1973.

# V. REGIONAL FEATURES OF AGRICULTURAL PRODUCTION

## A. Introduction

The purpose of this chapter is to lower the level of generalization from a national overview to a regional basis. Ghanaian agriculture is not homogeneous owing to a wide variation in climatic and ecological features, population densities and cultural patterns.

In the eight regions, the type and number of crops grown, the concentration of specific crops and the comparative advantage in production vary considerably.

## B. The Western Region.

Major Crops Grown. In the Western Region, 50 percent or more of the farmers are, in decreasing order of importance, involved in the production of cassava, (98%), plantain (67%), cocoyam (63%), cocoa (59%), and maize(50%). (See Table 70.)

On a national basis, using 1973 estimates, the Western Region ranked third in the production of cocoyam (20 percent of the national production) and fourth in the production of plantain (7 percent) and rice (6 percent). For a picture of the regions' relative contribution or ranking crop-by-crop on the basis of production, total acres, and the number of holders, see Table 70 below.

TABLE 70: WESTERN REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % Of Holders In the Region Producing the Crop | Relative National Importance of the Crop | | | | | |
|---|---|---|---|---|---|---|---|
| | | Holders | | Acres 1/ | | Production | |
| | | % | Rank | % | Rank | % | Rank |
| Maize | 50 | 7 | 7 | 4 | 8 | 5 | 8 |
| Sorghum | - | - | - | - | - | - | - |
| Millet | - | - | - | - | - | - | - |
| Rice | 6 | 10 | 5 | 9 | 4 | 6 | 4 |
| Cocoyam | 63 | 11 | 4 | 6 | 4 | 20 | 3 |
| Cassava | 98 | 12 | 5 | 10 | 5 | 8 | 6 |
| Yam | 8 | 3 | 8 | neg. | 8 | 2 | 8 |
| Plantain | 67 | 13 | 5 | 4 | 5 | 7 | 4 |
| Groundnuts | - | - | - | - | - | - | - |
| Cocoa | 59 | 14 | 4 | 11 | 4 | | |
| Oil palm | 11 | 17 | 4 | 35 | 2 | | |

Source: MOA, Current Agricultural Statistics, 1973.

1/ Includes crop in pure and mixed predominant stands.

On an acreage basis the Western region ranked second in oil palm production, accounting for 35 percent of the total acres. The region also accounted for 11 percent of the total acres in cocoa, thus ranking fourth on a national basis.

Labor resources in Agriculture. The Western Region, based upon 1970 estimates, had the second fewest number of holders in agriculture and the fewest number of individuals residing with holders. About 370 thousand people or 8 percent of the national total were domiciled with agricultural holders.

The median size of the holders' household was about 4.3 persons (about the national average). However, about 64 percent of the individuals living in these households were actually contributing labor full or part-time to the holding. Because of this and the relatively large holding size, the acres worked per family farm labor unit was 2.0 acres, the highest ratio in the country, (see Table 71).

Land resources. On the basis of total acres cultivated, the Western region in 1970 ranked 5th with about 10 percent of the national total , (see Table 72).

Comparative Advantage.[1/] The region has a strong advantage in production of oil palm and a relative advantage (4th.) in the production of cocoa and plantain. With the exception of these two crops the region is relatively unimportant in the national setting.

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1/ It is assumed that farmers have adjusted cropping patterns to the prevailing factor endowments in the region and that current crop concentrations reflect a comparative advantage in production.

TABLE 71: SELECTED LAND AND LABOR CHARACTERISTICS OF AGRICULTURAL HOLDERS

| Region | Median Size of Holders Household (Persons) A | % of Individuals Working on Holding (Percent) B | Family Farm Labor Force (Persons) C | Median Holding Size (Acres) D | Median Acres per Household Member E | Median Acres Per Family Farm Labor Unit F |
|---|---|---|---|---|---|---|
| Western | 4.3 | 64 | 2.8 | 5.5 | 1.3 | 2.0 |
| Central | 3.9 | 69 | 2.7 | 2.5 | 0.6 | 0.9 |
| Eastern | 3.8 | 70 | 2.7 | 3.0 | 0.8 | 1.1 |
| Volta | 4.0 | 80 | 3.2 | 2.2 | 0.6 | 0.7 |
| Ashanti | 4.4 | 68 | 3.0 | 4.4 | 1.0 | 1.5 |
| Brong-Ahafo | 4.7 | 67 | 3.2 | 5.4 | 1.1 | 1.7 |
| Northern | 5.4 | 68 | 3.7 | 4.2 | 0.8 | 1.1 |
| Upper | 5.2 | 66 | 3.4 | 4.3 | 0.8 | 1.3 |
| GHANA | 4.4 | 69 | 3.1 | 3.9 | 0.9 | 1.3 |

(1) A,B, and D obtained from the 1970 Sample Census of Agriculture.
(2) C = A x B E = D ÷ A F = D ÷ C
(3) A is equivalent to the Holding Consumption Unit.
(4) C is equivalent to the Holding Production Unit.
(5) E is the number of Family Consumption Units Per Acre.
(6) F is the number of Family Production Units Per Acre.

TABLE 72: REGIONAL NUMBER OF HOLDERS, CULTIVATED ACRES AND FARM FAMILY INDIVIDUALS, 1970

| Region | Holders | | | Total Cultivated Acres | | | Individuals In Holders Household | | |
|---|---|---|---|---|---|---|---|---|---|
| | No. | % | Rank | No. | % | Rank | No. | % | Rank |
| Western | 68,100 | 8.5 | 7 | 636,000 | 10.0 | 5 | 370,300 | 8.2 | 8 |
| Central | 81,100 | 10.1 | 5 | 414,000 | 6.5 | 6 | 405,800 | 9.0 | 7 |
| Eastern | 148,200 | 18.4 | 1 | 873,000 | 13.7 | 3 | 712,200 | 15.8 | 3 |
| Volta | 108,600 | 13.5 | 4 | 413,000 | 6.5 | 6 | 561,700 | 12.4 | 4 |
| Ashanti | 147,700 | 18.3 | 2 | 1,992,000 | 31.3 | 1 | 806,400 | 17.8 | 1 |
| B/Ahafo | 71,600 | 8.9 | 6 | 815,000 | 12.8 | 4 | 425,400 | 9.4 | 6 |
| Northern | 61,200 | 7.6 | 8 | 348,000 | 5.5 | 8 | 433,600 | 9.6 | 5 |
| Upper | 118,700 | 14.7 | 3 | 870,000 | 13.8 | 2 | 802,400 | 17.8 | 2 |
| GHANA | 805,200 | 100.0 | | 6,361,000 | 100.0 | | 4,517,800 | 100.0 | |

Source: Adapted from the 1970 Sample Census of Agriculture.

## C. The Central Region

Major Crops Grown. The Central Region is a major producer of plantain and in 1973 ranked second in the production of this crop (27 percent of the national production). On a national basis the region is relatively unimportant in crop production except for plantain.

In 1970, in the Central Region, 50 percent or more of the farmers were producing cassava (97%), maize (80%), plantain(65%) cocoyam (52%) and cocoa (52%) (See Table 73.)

Labor Resources in Agriculture. Ten percent of the country's agricultural holders were in 1970 in the Central Region, and about 9 percent of the individuals' domiciled in agriculture were residing in this region. The region ranks 5th in terms of the number of holders and 7th in terms of individuals living with holders.

The medium size of the holders household in the Central Region is about 3.9 persons. The median size of holding is 2.5 acres which is the second lowest in the country. The median acres per family farm labor unit is 0.9 acres which is the second lowest in Ghana, (the national average is 1.3 acres per family farm worker).

Land Resources. On the basis of total acres cultivated the region in 1970 ranked 6th with about 7 percent of the country's total cultivated acreage, (see Table 72).

**Comparative Advantage.** The Central Region has a comparative advantage in the production of plantain and accounts for 36 percent of the acreage cultivated to this crop in pure and mixed predominant stands.

TABLE 73: CENTRAL REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region Producing the Crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ % | Acres Rank | Production % | Production Rank |
|---|---|---|---|---|---|---|---|
| Maize | 80 | 12 | 4 | 10 | 6 | 12 | 6 |
| Sorghum | - | - | - | - | - | - | - |
| Millet | - | - | - | - | - | - | - |
| Rice | 1 | 1 | 8 | 1 | 8 | 2 | 8 |
| Cocoyam | 52 | 10 | 5 | 2 | 5 | 8 | 5 |
| Cassava | 97 | 13 | 4 | 9 | 6 | 11 | 5 |
| Yam | 51 | 6 | 6 | neg. | 7 | 2 | 7 |
| Plantain | 65 | 14 | 4 | 36 | 2 | 27 | 2 |
| Groundnuts | 3 | neg. | 7 | neg. | 7 | neg. | 7 |
| Cocoa | 52 | 14 | 3 | 8 | 5 | | |
| Oil palm | 3 | 6 | 5 | 5 | 4 | | |

Source: MOA, Current Agricultural Statistics, 1973.

1/ Includes crop in pure and mixed predominant stands.

## D. The Eastern Region

Major Crops Grown. In this region 50 percent or more of the farmers are producing cassava (89%), cocoyam (66%), and maize (66%). Forty-nine percent of the farmers produce plantain.

On the national basis using 1973 estimates, the Eastern Region ranked 2nd in the production of cocoyam (22% of the national production) and 3rd in the production of cassava (18 percent).

In terms of acres, the Eastern Region ranked first among all regions in the production of oil palm with 37 percent of the total acres devoted to this crop. Furthermore, the region was the second most important producer of cocoa in terms of total acres.

The region is an important maize producing region ranking fourth in terms of production and 3rd in terms of total acres.

Labor Resources in Agriculture. The Eastern Region ranks 1st in terms of the total number of holders in agriculture (18 percent of the total), and it ranks 3rd in terms of the total number of individuals living with agricultural holders.

Land Resources. In 1970 there were 873 thousand cultivated acres or 13 percent of the national total. The region thus ranked 3rd on this basis.

Comparative Advantage. The Eastern Region has a relative advantage in the production of cocoa, cocoyam and cassava. It has an absolute comparative advantage in oil palm production as the region accounts for 37 percent of the national acreage devoted to this crop.

TABLE 74: EASTERN REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region producing the crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ % | Acres Rank | Production % | Production Rank |
|---|---|---|---|---|---|---|---|
| Maize | 66 | 21 | 1 | 14 | 3 | 14 | 4 |
| Sorghum | - | - | - | - | - | - | - |
| Millet | - | - | - | - | - | - | - |
| Rice | 1 | 4 | 7 | 4 | 7 | 3 | 5-7 |
| Cocoyam | 66 | 27 | 2 | 23 | 3 | 22 | 2 |
| Cassava | 89 | 25 | 1 | 28 | 1 | 18 | 3 |
| Yam | 22 | 16 | 4 | 3 | 5 | 7 | 5 |
| Plantain | 49 | 22 | 2 | 10 | 3 | 5 | 5 |
| Groundnuts | 2 | neg. | 6 | 3 | 5 | neg. | 6 |
| Cocoa | 46 | 24 | 2 | 16 | 2 | | |
| Oil palm | 8 | 29 | 1 | 37 | 1 | | |

Source: MOA, Current Agricultural Statistics, 1973.

1/ Includes crop in pure and mixed predominant stands.

E. The Volta Region.

Major Crops Grown. In this region 50 percent or more of the farmers are involved in the production of cassava (90%), and maize (82%).

In terms of production the region ranked 1st in the production of cassava (23% of the national production) and 3rd in the production of yam (12 percent) and rice (13 percent).

In terms of total acres the Volta Region ranked 1st in maize (25% of the national acres) and 2nd in cassava and rice. The region ranked 3rd in terms of acres devoted to oil palm.

Labor Resources in Agriculture. The Volta Region ranks 4th in the number of holders and the total number of individuals residing with agricultural holders. In the region more of the individuals domiciled in agriculture work full or part-time on the holding (80 percent) than is the situation in any other region. However, the median holding size (2.2 acres) is the smallest of all the regions. Thus, there is 0.6 acres per holding resident or 0.7 acres per family farm labor unit. (See Table 71.)

Comparative Advantage. The Volta Region has an absolute comparative advantage in the production of cassava, and a relative advantage in the production of rice and yams.

TABLE 75: VOLTA REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region producing the crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ % | Acres Rank | Production % | Production Rank |
|---|---|---|---|---|---|---|---|
| Maize | 82 | 17 | 3 | 25 | 1 | 12 | 5 |
| Sorghum | 2 | 2 | 3 | 3 | 3 | neg. | 3 |
| Millet | - | - | - | - | - | - | - |
| Rice | 5 | 13 | 3 | 16 | 2 | 13 | 3 |
| Cocoyam | 32 | 8 | 6 | 2 | 6 | 5 | 6 |
| Cassava | 90 | 16 | 3 | 26 | 2 | 23 | 1 |
| Yam | 22 | 13 | 5 | 11 | 3 | 12 | 3 |
| Plantain | 23 | 7 | 6 | neg. | 6 | 4 | 6 |
| Groundnuts | 10 | 9 | 4 | 5 | 4 | 3 | 4 |
| Cocoa | 26 | 10 | 6 | 4 | 6 | | |
| Oil palm | 7 | 19 | 3 | 14 | 3 | | |

Source: MOA, Current Agricultural Statistics, 1973

1/ Includes crop in pure and mixed predominant stands.

F. Ashanti Region.

Major Crops Grown. The Ashanti Region is the major agricultural region in Ghana. Fifty percent or more of the farmers are producing cassava (87%), cocoyam (85%), plantain (79%), maize (75%) and cocoa (53%).

The region ranks 1st in the production of plantain, producing 40 percent of the national production, and cocoyam (30 percent). The region is 2nd in the production of cassava with 21 percent of the national production, and maize (17 percent).

In terms of acres Ashanti Region ranks 1st in cocoa (48 percent of the national acreage), plantain (41 percent) and cocoyam (44 percent). The region ranks second in terms of acreage devoted to maize.

Labor Resources in Agriculture. The Ashanti Region ranks second in terms of the number of holders, very closely behind the Eastern Region. In terms of the total number of individuals residing with agricultural holders the region is first with 18 percent.

Land Resources. There are more cultivated acres in Ashanti Region than any other region in the country. The 2.0 million acres in the Ashanti Region accounts for 31 percent of the cultivated areas in Ghana.

Comparative Advantage. The Region has an absolute comparative advantage in the production of plantain, and cocoyam, and on the basis of total acres, ranks first in the production of cocoa. The region ranks 2nd in the production of maize and cassava.

TABLE 76: ASHANTI REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region producing the crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ % | Acres Rank | Production % | Production Rank |
|---|---|---|---|---|---|---|---|
| Maize | 75 | 19 | 2 | 15 | 2 | 17 | 2 |
| Sorghum | - | - | - | - | - | - | - |
| Millet | - | - | - | - | - | - | - |
| Rice | 3 | 11 | 4 | 5 | 5-6 | 3 | 5-7 |
| Cocoyam | 85 | 28 | 1 | 44 | 1 | 30 | 1 |
| Cassava | 87 | 20 | 2 | 15 | 3 | 21 | 2 |
| Yam | 25 | 19 | 3 | neg. | 6 | 5 | 6 |
| Plantain | 79 | 29 | 1 | 41 | 1 | 40 | 1 |
| Groundnuts | 6 | 1 | 5 | 3 | 6 | 2 | 5 |
| Cocoa | 53 | 27 | 1 | 48 | 1 | | |
| Oil palm | 7 | 23 | 2 | 5 | 4 | | |

Source: MOA, Current Agricultural Statistics, 1973.

1/ Includes crop in pure and mixed predominant stands.

G. Brong-Ahafo Region.

Major Crops Grown. In the Brong-Ahafo Region 50 percent or more of the farmers produce cassava (77%), cocoyam (76%), plantain (75%), maize (73%), and cocoa (51%).

Brong-Ahafo Region is the leading producer of maize (19 percent of the national production) and yams (40 percent). In terms of acres the region ranks 2nd in cocoyam, and yams. The region is also a major producing area for groundnuts, cocoa and plantain.

Labor Resources in Agriculture. The region is relatively under populated in terms of the farm population. It ranks 6th nationally in terms of both the number of holders and the number of individuals living with agricultural holders.

Land Resources. The region ranks 4th in terms of the total cultivated acres (13 percent) and 2nd in terms of the median size of holding (5.4 acres). The median size of the holders household in this region is 4.7 persons. Given the holding size and the number of individuals working full and part-time on the holding, each family labor unit in Brong-Ahafo works 1.7 acres which is second only to the Western Region (See Table 71.)

Comparative Advantage. The Brong-Ahafo Region has an absolute comparative advantage in the production of yams and maize and a relative advantage in the production of groundnuts and plantain.

TABLE 77: KRONG-AHAFO REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region producing the crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ % | Acres Rank | % | Rank |
|---|---|---|---|---|---|---|---|
| Maize | 73 | 11 | 5 | 13 | 5 | 19 | 1 |
| Sorghum | 3 | neg. | 4 | neg. | 4 | neg. | 4 |
| Millet | 1 | neg. | 3 | 1 | 3 | neg. | 3 |
| Rice | 3 | 7 | 6 | 5 | 5-6 | 3 | 5-7 |
| Cocoyam | 76 | 14 | 3 | 24 | 2 | 15 | 4 |
| Cassava | 77 | 10 | 6 | 11 | 4 | 13 | 4 |
| Yam | 48 | 21 | 2 | 35 | 2 | 40 | 1 |
| Plantain | 75 | 16 | 3 | 8 | 4 | 17 | 3 |
| Groundnuts | 13 | 9 | 3 | 7 | 3 | | 3 |
| Cocoa | 51 | 12 | 5 | 15 | 3 | | |
| Oil palm | 3 | 5 | 6 | | | | |

Source: MOA, Current Agricultural Statistics, 1973.

1/ Includes crop in pure and mixed predominant stands.

H. Northern Region.

Major Crops Grown. The Northern Region is a major agricultural region. Fifty percent or more of the farmers are involved in the production of millet (95%), maize (90%), sorghum (90%), yams (79%) and groundnuts (54%).

The Region is the leading producer of rice and accounts for 54 percent of the national production and 46 percent of acreage. The region ranks 2nd in the production of sorghum (35 percent of the national production), millet (30 percent), yams (23 percent), groundnuts (25 percent) and beans and cowpeas (27 percent). The Northern Region ranks 1st or 2nd in more food crops than any other region and first for overall cereal and yam production.

Labor Resources in Agriculture. The Northern Region is the largest region in Ghana and has the lowest population density of any region -- 27 persons per square mile. The region ranks 8th in terms of the number of agricultural holders and 5th in terms of the total number of individuals domiciled in agriculture (10 percent of the national total). The region has the largest median agricultural household size (5.4 persons).

Land Resources. The Northern Region in 1973 ranked 8th in terms of total cultivated acres with only about 6 percent of the national total. Given this fact, since below average median acreage per family labor unit (1.1 acres) the region accounts for 54% of the national rice production, 35 percent of the sorghum production, 30 percent of the millet production, 25 percent of the groundnut production, 27 percent of the production of beans and cowpeas and 23 percent of the national yam production. The agricultural productivity per unit of agricultural labor and to a lesser degree unit of land, is relatively high in the Northern Region.

**Comparative Advantage.** In 1973 the Northern Region had an absolute comparative advantage in the production of rice and a relative advantage in the production of sorghum, millet, groundnuts, beans and cowpeas, yams and maize.

TABLE 78: NORTHERN REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region producing the crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ % | Acres Rank | Production % | Production Rank |
|---|---|---|---|---|---|---|---|
| Maize | 90 | 9 | 6 | 14 | 4 | 16 | 3 |
| Sorghum | 90 | 40 | 2 | 20 | 2 | 35 | 2 |
| Millet | 95 | 38 | 2 | 10 | 2 | 30 | 2 |
| Rice | 10 | 15 | 2 | 46 | 1 | 54 | 1 |
| Cocoyam | - | - | - | - | - | - | - |
| Cassava | 38 | 4 | 7 | 1 | 7 | 5 | 7 |
| Yam | 79 | 24 | 1 | 43 | 1 | 23 | 2 |
| Plantain | - | - | - | - | - | - | - |
| Groundnuts | 54 | 27 | 2 | 37 | 2 | 25 | 2 |
| Beans and Cowpeas | 19 | 11 | 2 | 28 | 2 | 27 | 2 |
| Cocoa | - | - | - | - | - | - | - |
| Oil Palm | - | - | - | - | - | - | - |

Source: MOA, Current Agricultural Statistics, 1973

1/ Includes crop in pure and mixed predominant stands.

I. Upper Region.

Major Crops Grown. In the Upper Region, 50 percent or more of the farmers produce millet (85%), Beans and Cowpeas (77%), and Sorghum (72%). Also, 49 percent of the farmers are producing groundnuts.

The Region is the leading producer of millet (producing 70 percent of the national total), groundnuts (70 percent), bean and cowpeas ( 67 percent) and sorghum ( 63 percent). In addition, the region ranks 2nd in the production of rice, producing 16 percent of the national total.

Labor Resources in Agriculture. The Upper Region ranks 3rd in terms of the number of holders in agriculture and 2nd in terms of the total number of people domiciled in agriculture (18 percent of the national total). On an overall population basis (rural and urban) the region ranks 4th with 10 percent of the total population. The population density in the Upper Region was estimated to be 82 persons per square mile in 1970.

Land Resources. The Upper Region on a national basis ranks 2nd in terms of total cultivated acres accounting for 14 percent of the total cultivated area.

The median holding size in the Upper Region is 4.3 acres which on a national basis ranks 4th. The median size of the agricultural holders household is 5.2 persons which is second only to the Northern Region. The acres cultivated full or part-time per family labor unit is about 1.3 acres which on a national regional basis ranks 4th.

Comparative Advantage. The Upper Region has an absolute comparative advantage in the production of four crops -- millet, sorghum, groundnuts and beans and cowpeas in terms of national production.

TABLE 79: UPPER REGION: RELATIVE IMPORTANCE OF SELECTED CROPS, 1973

| Crop | % of Holders in the Region producing the crop | Relative National Importance of the Crop: Holders % | Holders Rank | Acres 1/ )% | Acres Rank | Production % | Production Rank |
|---|---|---|---|---|---|---|---|
| Maize | 23 | 4 | 8 | 6 | 7 | 6 | 7 |
| Sorghum | 72 | 57 | 1 | 77 | 1 | 63 | 1 |
| Millet | 85 | 59 | 1 | 89 | 1 | 70 | 1 |
| Rice | 15 | 39 | 1 | 13 | 3 | 16 | 2 |
| Cocoyam | - | - | - | - | - | - | - |
| Cassava | 3 | 4 | 7 | neg. | 8 | neg. | 8 |
| Yam | 7 | 4 | 7 | 7 | 4 | 8 | 4 |
| Plantain | - | - | - | - | - | - | - |
| Groundnuts | 49 | 43 | 1 | 44 | 1 | 70 | 1 |
| Beans & Cowpeas | 77 | 85 | 1 | 72 | 1 | 67 | 1 |
| Cocoa | - | - | - | - | - | - | - |
| Oil palm | - | - | - | - | - | - | - |

Source: MOA, Current Agricultural Statistics, 1973.

1/ Includes crop in pure and mixed predominant stands.

J. On-farm Features

As explained in Chapter III, Section A, Ghana's farmers operate in a variety of ecological zones. These zones influence cropping patterns and to some extent land rotation patterns. Farm enterprise and factor combinations and the extent of multi-cropping also vary among ecological zones and with farm size. However, there is little farm research on any meaningful scale to explain these points in detail. Much more work needs to be done so that variations in farming systems and enterprise and factor combinations can be identified and related to ecological zones and farm size. Compared to the multi-disciplinary work on farm systems in Nigeria at IITA and RFRU at Zaria, there is little similar work presently done in Ghana.[1/]

A farm planning manual was prepared in 1972 by the Agricultural Extension Division of the University of Ghana at Legon. The manual was designed primarily for the use by students and mechanised farmers. The manual contains some very rough estimates of net returns to land, labor and capital. These estimates were developed on a per acre basis independent of farm size, for different enterprises with variations in labor use. Also, they were based on classroom estimates and not on field research and were developed with rather limiting assumptions with regard to the opportunity costs of the factors of production.

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1/ There are several isolated research projects by a few economists with ISSER and UST at Kumasi.

The estimates show the highest returns to land, capital and labor for vegetables, such as onions, shallots and hot pepper, ranging from ¢1,056 to ¢491.00 per acre. The lowest returns were for plantain, unmechanized maize and mechanized maize, ranging from ¢91.00 to ¢69.00 per acre. Activities giving the highest returns to labor were mechanized groundnuts followed by unmechanized maize, unmechanized groundnuts and unmechanised shallots. The lowest returns were for unmechanized cassava, yams and garden eggs. The data suggest slightly lower returns to capital, land and labor for mechanized operations as compared with non-mechanized operations. Mechanized operations show higher returns to both labor and land than non-mechanized operations, but lower returns to capital. If the most limiting factor in Ghana is capital, then this data suggest that appropriate forms of capital and technology have yet to be found which yield high returns to both capital and labor, and can compete with more traditional forms of capital. The data also show that relatively labor-intensive and high value crops such as onions, hot pepper and tomatoes give, by a substantial margin, the highest returns to capital.

The small-scale farmer produces most of his capital (fixed and non-fixed) resources on the farm, using primarily family labor. These are seeds, simple tools, sheds, stakes and simple storage devices. As farmers purchase an increasing proportion of their capital resources (rather than producing them on the holding) the risks to farming increase . These risks will be reduced if purchased capital resources yield relatively higher returns and are available at the right time and place, and in appropriate quantities.

The degree of market dependence varies with farm size and the degree of specialisation. The farmer cultivating more than 2 - 2.5 acres is more market dependent than a farmer cultivating less, as the typical farmer requires 2 to 2.5 acres to meet his household's subsistence requirements. In Chapter III Section 1 we have shown that farms cultivating 3 acres or less market a significant portion of their total production. They are, therefore, market dependent in the sense that their incentive to increase total production is determined by the efficiency of the marketing system and its ability to signal fair and stable market prices. Farmers reduce their market dependence by inter-cropping, which provides the household with a wide range of products.

The major constraints to production on small scale holdings in Ghana have to do with the complexity of the physical, social and economic environment in which the farmer operates. These complexities have been described elsewhere in this report. Suffice it to say that within this environment and with a relative abundance of land, the small-scale farmer has been able to combine his resources and enterprises efficiently[1/], while maintaining soil fertility. However, this efficiency has been attained at low levels of output in relation to all the factors that the farmer combines in the production process. This means that the small-scale farmer cannot increase his output by a different combination of his existing resources. He can only increase his output by improving the quality or the total quantity of his resources. In either case it will take a period of adjustment before the most efficient combination of resources is found at higher levels of output. During the

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1/ See D.W. Norman's work from Ahmadu Bello Univ., Zaria, Nigeria, for evidence of this point

adjustment period, however, the risks and uncertainties to farming will be greater than before. A farmer's ability to bear these risks is frequently just as much a constraint to increased output as the farmer's ability to change the quality or quantity of his resources. This is likely to be even more so for farmers in a multi-cropping situation where the period of adjustment will certainly be relatively longer.[1/]

Increases in the quality or quantity of any one resource will require appropriate increases in complementary resources, if the potential returns to the changed resource are to be achieved. For example, increases in land will no doubt require increases in labor. Similarly, improved seeds or fertiliser will also require additional labor for weeding and harvesting.

We are not able to describe the nature and magnitude of these interrelationships in detail in this report. However, they are the primary determinants of the production constraints to increasing agricultural production. We hope to have pointed to the need for examining these questions and undertaking field level research in Ghana to obtain more understanding of smallholder farming systems.

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1/ Especially if the adjustment were to lead to a pure crop situation.

# CHAPTER VI - GOVERNMENT AGRICULTURAL POLICY

# VI. GOVERNMENT AGRICULTURAL POLICY[1/]

## A. Background.

Soon after the National Redemption Council came to power (January 1972) they established Agriculture as the top priority of the new government. The Government launched the "Operation Feed Yourself Programme," commonly known as OFY, which was a national crash program to increase domestic food production.

The initial thrust of the OFY Program was to create a national awareness of the importance of agriculture in the Ghanaian economy. It was stressed at the beginning of the program that the backbone of the economy and the present standard of living achieved in Ghana was largely due to agriculture and particularly cocoa. The program was established on an idealogical basis by stressing "self-reliance" and "self-sufficiency in food production."

## B. Current Policy Directions.

### 1. Domestic Self-sufficiency in Food Production.

Unlike in the past (principally the decade of the 1960s) OFY envisioned that increased agricultural production would be mainly generated in the private sector, principally by means of acreage expansion. Specific commodity oriented import substitu-

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1/ This Chapter basically summarizes the main policy orientations and mechanisms elaborated on inChapter II, III and VIII.

tion programs, which were mainly in the planning stages in the previous government, were a major emphasis in the initial year of the program. These included rice, maize, livestock, sugar-cane, oil palm and cotton.[1] In addition, new emphasis was given to yam, cassava, plantain, and sorghum production.

The underlying reasons for the drive towards self-sufficiency have been illustrated in Chapter II, (Role of Agriculture in the Ghanaian Economy). As was illustrated, Ghana's food import bill has been increasing, costing the country a great deal in terms of foreign exchange and under-employed domestic resources. The NRC decided that domestic resources should be mobilized to increase the domestic production of food crops in which the country could save on imports (import substitution) plus, increase the production of traditional crops like plantain, cassava, yam and cocoyam upon which the majority of the population depends (a form of self-reliance).

The principal mechanism by which it was envisioned that OFY could achieve increased food production was via acreage expansion. Given the stock of output increasing technologies that were available and the reliance on the great majority of farmers (the smallholder), the acreage expansion route was the main vehicle which could be pursued in the short-run. This was appropriately recognized and a campaign to achieve "national awareness" and greater effort among the rural

1/ These were IBRD/IDA project proposals that had passed the "identification" stage and for which feasibility studies were in process.

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population/was pursued by government officials and the national press. Rural chiefs were urged to make available agricultural lands to those who wished to participate in the OFY program. Many chiefs responded.

To stimulate and monitor the program the Ministry of Agriculture requested Regional Agricultural Officers and their staffs to undertake reconnaissance surveys to identify the major crop production activities, available lands, physical input needs, and financial requirements to expand the acreages of the major crops produced in their respective regions. These estimates along with supporting justifications were forwarded to the Central Ministry in Accra for review.

The staff of the Central Ministry, on the basis of the regional crop and acreage reports, then established acreage targets for the major food crops on a regional basis. The country was divided up into major agricultural zones on the basis of crops, and the major crops produced within these zones were given priority by the regional extension staffs.

Since the initial year of OFY more emphasis has been given to increasing crop yields. The main thrust here has been on increasing the supply of inorganic fertilizer, improved seed and to a lesser extent improve plant materials and plant protection chemicals. Since 1972 the number of acres cultivated to most food crops, the number of holders (farmers) and the total domestic production of most crops has increased. These facts are illustrated in Chapter III (Section F)

"Structure of the Agricultural Sector," and Chapter V, "Regional Features of Agricultural Production."

The conclusion is, that the GOG through the OFY program has achieved progress with respect to increasing domestic food production.

2. The Role of the Smallholder.

With respect to agricultural policy, one of the most significant changes since the NRC came to power has been a shift of emphasis from large-scale, capital-intensive, public production units to an emphasis on smallholder production. This reorientation of policy was clear in formative year of the OFY Program.

Despite the initial reliance on the small-scale farmer to increase food production, increasing emphasis was placed on larger farms which use relatively capital intensive production systems in certain areas of the country and in the production of certain crops. Examples are rice in the Northern Region and maize in various areas of the country. This may have been in response to two factors. First, this may have been due to the overly optimistic forecasts of increased production and achievement of "self-sufficiency" in food production in the short-run; the resulting frustration coupled with a belief that large farmers (particularly rice farmers) were more responsive to increased output requirements may have led to this view. Second, given the progress made in the last two years to reduce the external debt burden and to increase foreign exchange reserves 1/ (before the petrolium crisis),

1/ The reduction in the external debt burden was largely achieved by a unilateral repudiation of the debts which arose during the Nkrumah era (and latter rescheduling). The increase in foreign exchange reserves was largely due to an increase in the world cocoa and timber prices and a lower level of imports due to imposed restrictions.

the government probably thought it could afford to import more farm machinery to support special sub-sectors in agriculture. During 1972 and 1973 there were large imports of tractors and associated equipment, plus combine harvesters to support largely the rice industry.

Currently there is a strong belief among many government officials that much more emphasis, particularly at the operational level, needs to be directed toward the smallholder community. A real desire exists in many government departments to vigorously move in this direction. However, the GOG has not been able to define an operational smallholder production strategy. Ghanaian officials are searching for such a strategy; they are searching for some input(s), crop(s), price structure, institutional framework, etc. that can be tried and which will work.

Since this search is still taking place, and probably will for some time, there is not a conceptual, let alone operational, smallholder strategy that one can describe. From a policy point of view one can only say that the GOG desires to rely increasingly on smallholders to increase food production.

3. Capital vs. Labor Intensive Techniques.

Given the announced policy to improve the productive capacity of smallholders the government will have to rely on labor intensive production techniques to a large extent. Given the total population projections, and the rural and urban labor force projections developed in Chapter III (SectionC) and Chapter VII "Future Outlook Under Present Policies", the GOG will have to formulate agricultural policies which

will increase the capacity of agriculture to absorb increasing quantities of labor. Given the projected foreign exchange gap during the rest of the decade (See Chapter II) the country will not be in a position to import large quantities of capital to support agriculture. The nature of capital imports will have to be increasingly divisible with respect to farm size, and complementary to labor.

Statements made by government officials indicate the need and desire to involve labor-intensive techniques in agriculture, construction, manufacturing and particularly small-scale rural industrialisation. The problem lies in the identification and availability of improved labor-intensive techniques, particularly for small-scale agriculture.

4. Land Expansion vs. Yield Increasing Technology.

As has been pointed out the main mechanism used to expand food production has been through acreage expansion. The MOA has, over the last two years, been placing increasing emphasis on crop yields. This has been largely through the increased provision of improved seed and fertilizer (See Chapter III, Section F.)

If appropriate government policies are formulated in the forecoming National Plan, continued acreage expansion is possible. Our projections show that the rural labor force will increase by 76,000 per year. If improved labor intensive techniques are pursued, if the product marketing system is improved and if labor displacing mechanisation is discouraged, then it is possible that small farmers will be

encouraged to hire additional labor to expand their acreage and output. It appears that both land expansion and increased yields are required if agriculture is going to be able to feed increasing numbers of people. The current policy is to tackle the problem on both fronts with increasing emphasis on yield increases for food and industrial (raw material) crops.

C. Production Incentives.

The NRC has increased the incentives for farmers to expand production and for non-farmers to engage in agricultural production. The main mechanisms have been subsidised credit, input subsidies, guaranteed minimum product prices, and increased availability of improved seed (mainly rice and maize) and fertiliser. In addition, the government has imported large quantities of tractors and combines mainly to support large-scale rice farmers and to a lesser extent maize growers.

These incentives and their impact have been discussed in various parts of the report which deal with the individual subjects and will, therefore, not be elaborated here.

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# CHAPTER VII - FUTURE OUTLOOK UNDER PRESENT POLICIES

# VII. FUTURE OUTLOOK UNDER PRESENT POLICIES

## A. Food and Nutrition.

The national production estimates developed in previous chapters have been summarized in Table 80 and the caloric estimates have been determined for each food crop after taking account of anticipated rates of loss due to spoilage and waste.

### 1. Domestic Food Availability.

Table 80 indicates that based upon 1973 domestic food production estimates there were 2,647 calories per capita per day available for human consumption. In deriving this estimate no consumption estimate was made for the amount of domestic production that might have been consumed by livestock. In addition, it is assumed that all domestic production is consumed within Ghana. 1/

Superficially, the availability of 2,600 calories per capita compares favorably to minimum subsistence requirements under tropical conditions which have been estimated by FAO to range from 1,600 - 1,800 calories per person per day. Of course it is known that the majority of Ghanaians are well above the "subsistence" level. There are, however, pockets or areas where people are below subsistence requirements (parts of the Upper Region for example).

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1/ The team was unable in the time available, to determine quantities used for livestock or make estimates for informal exports of food.

However, the Ghanian diet is based upon starches which, relative to cereals, are protein poor. From domestic sources, Ghanaians potentially derive 68% of their caloric intake from starches. It should be noted that starches account for 87 % of the total domestic food production (See Table 80 ). In Ghana only 860 calories per person per day is derived from grains from domestic sources. The starch/grain ratio has important implications for the quality of the Ghanaian diet.

It has not been possible to determine the extent to which starches are supplemented with proteins, vitamins and minerals from ingredients used in stews and sauces which are commonly based upon meat and vegetables in the preparation of traditional dishes. It is generally known, however, that with rising urbanization, education and incomes, Ghanaians augment their caloric, protein and vitamin intake from increasing proportions of cereals, fish, meat and imports.

The increase in domestic grain production has been discussed in Chapters IV and V. Using the 1973 production estimates and assuming an equal food distribution among the populace, Ghanaians in theory derive 32 % of their caloric intake from grains, yet grains account for only 13% of total domestic food production. From Table 80 it can be seen that grains are a superior source of calories, on the average, providing three times as many calories per 100 grams as starchy food stuffs. In addition, it is well known that grains are higher in essential amino acids. The combination of these two factors

Table 80: **DERIVATION OF TOTAL CALORIES AVAILABLE FROM DOMESTIC PRODUCED FOODSTUFFS IN 1975**

| Crops | Rate of Wastage and Seeds 1/ % | Net Production 2/ (000's Tons) | Per Cent | Calories 3/ Per 100 Grains | Total Calories Billions | Per Cent |
|---|---|---|---|---|---|---|
| I. Starches | | 4,977.2 | 87 | | 6,066.7 | 68 |
| A. Roots & Tubers | | 3,700.8 | 64 | | 4,343.6 | 49 |
| Cassava | 19 | 2,248.6 | | 124 | 2,788.3 | |
| Yams | 31 | 462.7 | | 118 | 546.0 | |
| Coco Yams | 24 | 989.5 | | 102 | 1,009.3 | |
| B. Other | | 1,276.4 | 22 | | 1,723.1 | 18 |
| Plantain | 37 | 1,276.4 | | 135 | 1,723.1 | |
| Banana | N.A. | N.A. | | 880 | N.A. | |
| II. Grains | 12 | 772.9 | 13 | | 2,917.9 | 32 |
| A. Cereals | | 654.3 | 11 | | 2,294.2 | 25 |
| Maize | | 580.8 | | 357 | 1,288.1 | |
| Rice | | 55.4 | 1 | 353 | 196.6 | 2 |
| Sorghum | | 144.8 | | 340 | 492.3 | |
| Millet | | 93.3 | | 341 | 318.2 | |
| B. Grain Legumes | | 118.0 | 2 | | 623.7 | 7 |
| Groundnuts | | 105.6 | | 549 | 579.7 | |
| Cowpeas | | 6.2 | | 342 | 21.2 | |
| Bambara Beans | | 6.2 | | 376 | 22.8 | |
| III. TOTAL | | 5,750.1 | | | 8,984.6 | |

1/ Department of Agriculture Bulletin, Accra 1951

2/ Gross production adjusted for wastes and seeds

3/ Food Consumption Table for Use in Africa - FAO & U.S. Dept. of Health, Education & Welfare 1968.

points to the need to expand the production of cereals, thus permitting a switch in consumption patterns toward a higher quality grain based diet.

These substitution effects have in fact been taking place in the urban centers and this phenomenon along with seasonal fluctuations in the availability of grains and other food stuffs, and rising population has put pressure on, and caused rising food imports.1/

Fish has been a traditional source of protein for the coastal population, However, this source of protein has been less important up-country. The Government has, however, taken aggressive steps to improve the distribution of frozen fish by establishing cold-store facilities in various parts of the country.

The tendency to substitute grains for starches in food consumption can be observed from the pattern and increase in the quantity of food imports for the years 1970-73 which are given in Table 81. If calories from these imports (estimated to be 906 trillion excluding fish from the high seas) were evenly distributed among the population, each Ghanaian would have derived 2,913 calories per day. Including fish from the high seas the per capita caloric intake would be 2,972 per day. Food imports, therefore, augment caloric intake from domestic production by about 11 %. This is a considerable amount especially when one considers that the bulk of food imports are probably consumed by high income, urban consumers who may derive as much as 30-40 % of their total caloric intake from imported food.

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1/ There is a tendency to consume larger proportion of grains during October-January (the grain harvest period) when their availability is greatest.

## TABLE 81: IMPORTS OF MAJOR FOOD STUFFS, 1970-1973

(tons)

| Item | 1970 | 1971 | 1972 | 1973 | Calorie[3/] Per 100 Gram |
|---|---|---|---|---|---|
| Wheat | 59,169 | 38,152 | 84,839 | 96,302 | 350 |
| Rice | 52,283 | 34,555 | 23,885 | 52,728 | 353 |
| Maize | 5,187 | 3,314 | Neg | 2,376 | 357 |
| Cereal | | | | | |
| Flour | 18,051 | 6,115 | 1,664 | 2,352 | 364 |
| Other Polished Grains | 401 | 365 | 176 | 1,867 | 351 |
| Malts Flour | 5,363 | 6,240 | 8,236 | 13,776 | 375 |
| Vegetables Products | 9,415 | 3,479 | 1,712 | 2,014 | 60 |
| Beet and Cane Sugar | 129,341 | 59,642 | 44,339 | 55,308 | 320 |
| Milk Products | 22,785 | 27,062 | 9,246 | 7,551 | |
| Fish | | | | | 220 |
| High Seas | N.A. | N.A. | 58,804 | 90,215 | |
| Other | 29,688 | 30,718 | 16,088 | 19,584 | |
| Cattle No: 2/ | 61,882 | 55,713 | 37,014 | 33,721 | 320 |
| Sheep No: 2/ | 10,904 | 15,621 | 6,371 | 8,118 | 265 |
| Goats No: 2/ | 29,398 | 30,440 | 8,103 | 13,627 | 270 |
| Fowls No: 2/ | 57,520 | 119,505 | 87,866 | 134,888 | 220 |
| Meat Products | 8,290 | 6,037 | 2,321 | 2,303 | 250 |
| Animal Oils and Fats | 11,899 | 19,645 | 16,647 | 5,455 | 500 |
| Fixed Vegetable Oils | 2,943 | 6,032 | 2,489 | 14,072 | 500 |
| Total Tons | N.A. | N.A. | 275,364 | 370,289 | |

1/ Source: External trade statistics
2/ The following per unit weights are assumed:
3/ Cattle .125 tons; Sheep and Goats .0125; Fowls .00125 tons
Food composition table, IBID.

To describe the major levels and sources of caloric intake and to develop projected food requirements, data from Tables 80 and 81 are summarized as follows:

IMPUTED LEVEL OF AGGREGATE CALORIE
AVAILABILITY IN GHANA, 1975

| | Source | Tons (000's) | % | Total Calories (billion) | Availability of Calories per Capita (daily) | % |
|---|---|---|---|---|---|---|
| A. | Domestic | 5,750.1 | 93.9 | 8,984.6 | 2,647 | 89 |
| | Starches | 4,977.2 | 81.5 | 6,086.7 | 1,787 | 60 |
| | Grains | 772.9 | 12.6 | 2,917.9 | 860 | 29 |
| B. | Imports a/ | 370.3 | 6.1 | 1,104.8 | 325 | 11 |
| C. | Total | 6,120.4 | 100.0 | 10,089.4 | 2,971 | 100 |

The rate of urbanization is taken into account when deriving projections of food requirements. There is strong evidence to suggest that with rising education and urbanization, tastes and preferences switch away from starches to grains and imported food items. For example, grain imports, most notably wheat, have increased from 140,454 tons in 1970 (including flour and malts) to 169,401 tons in 1975.1/ This is an annual compound rate of 6.45 % which is above the rate of increase of the urban population which was estimated to be 4.7 % per annum between 1960 and 1970. We assume, based on population projections developed by the Regional Institute for Population Studies in Ghana,

a/ Includes fish from the high seas
Note: Assumes an equal distribution and availability of foodstuffs and no food production leaving the country.

1/ This amount was 26 % of the total cereal production in 1975. In the same year rice imports were almost equal to domestic paddy production or in milled equivalent 1/3 higher than domestic production.

that aggregate population growth in Ghana will increase by 2.8 % per annum between 1975 and 1980. In addition, we assume the urban population will increase by 4.68 % per annum.

In order to project increases in the demand for grains it is assumed that such increases are primarily explained by relative rates of growth of the rural and urban populations. The per capita grain consumption of the urban population is derived on the basis of the following assumptions: Of the total domestic grain production in 1975, 50% or 386,400 tons were marketed of which 75 % or 289,800 tons were consumed in urban areas. Per capita grain consumption in urban areas including imports of 169,400 tons is estimated to have been 375 lbs. in 1975. This implies that per capita rural consumption of grains was 165 lbs. or about 33 % of the total estimated aggregate per capita calorie intake. These assumptions and resulting estimates are reasonably consistent with the proportion of total calories derived from grains out of the estimated total domestic food production as shown in Table 80. Per capita consumption of starches are derived as a residual. For rural consumers per capita starch consumption is estimated to be 1,295 lbs in 1975; or, the amount necessary, given rural caloric intake from grains, to bring total per capita intake to 2,648 calories/person per day. Per capita urban starch consumption for 1975 was derived from the difference between total starch consumption and rural starch consumption.

Total consumption of grains and starches are projected in Table 83 for urban and rural consumers. The table illustrates that consumption of grains and starches will increase by 2.71 % per year over the 1975-85 period given over projected urban and rural

Table 23: ESTIMATED ANNUAL[1/] PER CAPITA (URBAN AND RURAL) CONSUMPTION OF GRAINS AND STARCHES

| | 1973 lbs. | | | 75-85 ANNUAL GROWTH RATES |
|---|---|---|---|---|
| | URBAN | RURAL | TOTAL | |
| Grains | 375 | 165 | 227 | |
| Starches | 966 | 1295 | 1198 | |
| Total | 1341 | 1460 | 1425 | |
| **Total Consumption Tons 000's** | | | | |
| **1975** | | | | |
| Grains | 526.8 | 492.6 | 1019.4 | |
| Starches | 1357.1 | 3866.5 | 5223.6 | |
| | | | 6243.0 | |
| **1980** | | | | |
| Grains | 670.3 | 535.9 | 1206.2 | |
| Starches | 1726.7 | 4205.9 | 5932.6 | |
| | | | 7138.8 | |
| **1985** | | | | |
| Grains | 832.4 | 585.8 | 1418.2 | 3.36 |
| Starches | 2144.2 | 4597.3 | 6741.5 | 2.56 |
| | | | 8159.7 | 2.71 |
| **Total Consumption (Tons 000's) in 1985 Assuming Rural Starch/Grain Consumption Ratios are equal to Urban Ratios.** | | | | |
| Grains | 832.4 | 1331.3 | 2163.7 | 7.82 |
| Starches | 2144.2 | 3429.3 | 5573.5 | .65 |
| | | | 7737.2 | 2.17 |

1/ Derived from Table 3 and assumptions listed on page 217.

population increases and differences in per capita consumption of grains and starches for urban and rural consumers. For 1975 the per capita consumption starch-grain ratio is estimated to be 2.58; for rural consumers this ratio is estimated at 7.85.

Holding these ratios constant at respective 1975 levels, grain consumption will increase by 3.36 % per year over the 1975-85 period and starch consumption by 2.56 % per year. If, however, rural consumption patterns were to be similar to urban consumption patterns by 1985 (ie., the starch-grain ratio of rural consumers equalled that of urban consumers) then, the consumption of both grains and starches would increase by only 2.17 % per year. But, grain consumption would increase by 7.82 % per year and starch by only 0.65 % per year.

It follows, therefore, that changes in the tastes and preference for grains are very important determinants of future production patterns and requirements.

Even with starch-grain ratios (rural and urban) held constant at 1975 levels, the increase in urban consumption for grains will explain 80 % of the total increase in the consumption for grain products in 1985. Urban consumption will explain an estimated 59 % of total grain consumption in 1985 compared to 49 % in 1975.

The implications of this projection on the performance of domestic marketing channels (farm - rural market, regional assembly, urban wholesale markets) are enormous, unless a considerable proportion of total grain requirements are met by imports.

2. Implications

The degree to which projected consumption increases can be met depends on the manner in which Ghana's present policy of self suffi-

ciency is interpreted and implemented. If, by any stretch of the imagination, the policy of self sufficiency should imply a reduction of all grain imports to zero by 1985 then domestic grain production would have to increase by 5.19 % per year over the 1975-85 period to keep pace with projected consumption increases. If total (as opposed to per capita) wheat consumption could be held constant at the 1975 level of 96,500 tons then domestic grain production would have to increase by 4.57 % per year. However, if more realistic per capita imports and consumption of wheat were to be held constant at the 1975 level of 25.2 lbs/capita (for urban and rural) then domestic grain production would have to increase by 4.32 %/year to meet grain demand increases over the 1975-85 projection period.

For domestic grain production to keep pace with increases in projected consumption, assuming constant 1975 per capita wheat consumption, agricultural policy would have to be directed toward:

a) a large acreage expansion at constant yields,

b) major progress on achieving increased yield per acre, or more likely,

c) a combination of land extension and increased yields per acre.

The "Operation Feed Yourself Program" of the Ministry of Agriculture has in the initial years of the program placed major thrust on land expansion and to a lesser degree on yield increases. Such a strategy has obvious attractions in the short-run, owing to a relative ease of implementation, a shortage of yield-increasing technologies, and its political impact. However, as will be shown, in the longer run a policy placing major emphasis on acreage expansion could encounter

severe constraints.

To meet increasing consumption requirements over the 1975-85 period, while holding wheat imports and the urban and rural starch-grain ratios at the 1975 per capita level, would require an overall total grain production increase of 42,620 tons per annum. This implies with the present national weighted average grain yield of 950 lbs per acre that the area cultivated to grains would have to expand by 100,500 acres per year, or by 1,206,000 acres by 1985. Such an acreage increase represents about 18% of what is currently under cultivation at the national level. (In 1975 there was an estimated 6.7 million cultivated acres).1/

Under present, or relatively labor intensive techniques of cultivation, the required annual increase in cultivated grain acreage (ie., 100,500 acres per year) would require an annual incremental increase in the farm labor force (defined as family and hired laborers working on the farm full or part-time) of about 56,280 persons. This takes as given the current overall labor/land ratio of 0.56 persons per cultivated acre as developed earlier in this report 2/. This of course assumes present yields and a heavy dependence upon the hand hoe and cutlass.

It should be stressed that an average annual increase in the farm labor force of 56,280 workers is possible. Based upon the present rural

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1/ It has been estimated that there is about 14 million cultivable acres in the country.

2/ In 1970, there were 3.5 million persons active on agricultural holdings on a full-and-part-time basis (family and hired labor) and 6.5 million acres were under cultivation of all crops.

age distribution in the 15-44 age group it is estimated that over the next five years this group will increase by 368,000 persons, or by 73,600 per annum. With appropriate wage policies, the provision of adequate social amenities in rural areas, agricultural production incentives and the anticipated acute shortage of urban jobs, a large share of 73,600 potential rural workers could be induced to stay in rural areas and engage in productive farm employment. Thus, it could be argued that a policy of land expansion for increased grain production could, under appropriate policies, be achieved at the required level of 100,500 acres per year. The constraint will be realized, however, if appropriate policies are not implemented.

If on the other hand, relatively capital intensive techniques were utilised to bring the required increase in acreage under grain cultivation there would be severe limitations on this approach. For example, the foreign exchange costs for tractors and associated equipment including spare parts would amount to about US$5 million per year. Adding petroleum products, and service facility requirements, this figure increases considerably. There would also be massive management and training requirements for the supporting infrastructure and not least of all the equipment owners and operators. The requirements for overall improved farm management of such a production system would be a major constraint at the present time.

It is not surprising, therefore, that the present Government is now emphasing a strategy of involving large numbers of small holders to obtain overall increases in agricultural production.

The challenge facing Ghana is how to design an effective program which is based upon the existing under-utilized relative factor endow-

ments in agriculture. There are about 867,000 agricultural holders, 82 % operating less than 10 acres, and a total farm population of 4.5 million persons. It has been shown in previous chapters that this 82 % produces the great bulk of the total available food. A program designed to increase agricultural production among small holders appears to be the only hope of increasing food production, and particularly grain, to levels projected to be required over the next decade.

In addition to designing a small holder program an equal challenge is to effectively implement a program among a large population of small holders. An important issue is, to what level and by whom should or can the planning for small holder development be done. This is addressed in the next Chapter.

B. Rural Employment and Migration.

In Chapters II and III it was shown that agriculture has not attracted a significant proportion of the annual additions to the male labor force during the decade of the 1960s. During this period, while the percentage of the female work force increased, the proportion of the total work force employed in agriculture decreased. It follows that agriculture did not attract significant numbers of females either. In many regions of the country the result was labor shortages during periods of seasonal peak farm labor requirements.

A survey 1/ investigating the seasonality of employment in agriculture found that full-time migrants found little difficulty in obtaining casual work throughout the year.

Full-time local workers, however, generally worked less than full-time migrant workers. This was because farmers preferred migrant workers, since local workers did not want to do hard and difficult farm operations such as clearing and brushing. The survey suggests fairly full use of permanent migrants throughout the year but under-employment of full-time local laborers and local small-scale farmer laborers who worked only about 102 to 159 of the 204 available days in the year.

Except for local full-time workers in Tamale District (Northern Region) the migrant worker obtained higher annual wage

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1/ B.E. Fourke and F.A. Obeng. "Seasonality in the Employment of Casual Agricultural Labor in Ghana". Research Report No. 1, Dept. of Agric. Economics and Farm Management, University of Ghana, Legon, 1973.

incomes than the local full-time workers. However, as the researchers show, these incomes were generally two-thirds of the urban minimum wage income in 1973 (N¢243.00 per annum).

It is likely that migrants (from urban areas) will work in agriculture for a short time but then return to the urban area when they have acquired sufficient savings. A very important task for Ghana will be how to make farming and farm work more attractive, so that agriculture can absorb a greater share of the increasing additions to the total labor force in the future.

The following table projects the additions to the total labor force between 1975 and 1985:

TABLE 84: LABOR FORCE (AGES 15 - 44) PROJECTIONS, 1975-85 1/

| Year | Total | 000's Urban | Rural |
|---|---|---|---|
| 1975 | 3,926 | 1,401 | 2,525 |
| 1980 | 4,759 | 1,866 | 2,893 |
| 1985 | 5,500 | 2,329 | 3,171 |
| Annual Rate of Growth | 3.43 % | 5.21% | 2.3% |

1/ Adapted from Estimates Developed by the Regional Institute of Population Studies, Accra.

These projections, incorporating assumed rates of migration, indicate that over the 1975-1980 period there will be an annual average addition of 166,600 people to Ghana's labor force. The additions to the urban labor force will be 93,000 per year and to the rural labor force 73,600 per year. Based on past rates of increases in employment, agriculture will only absorb, in gainful employment, an average of 24,000

persons per year. And, based on the past, the vast majority of these additions will be females.

Since agriculture employs the bulk of the work force, 57 % in 1970, a development strategy must focus on means to increasing the labor absorptive capacity of agriculture and related sectors.

Possible action programs which could be encouraged or undertaken by Government would include:

a) Rural work projects such as feeder roads, conservation works, construction of earthen dams;

b) Provision of rural social amenities (e.g. health posts, piped water, recreation centers) using labor intensive techniques, and

c) Establishment of rural "labor markets", or employment stations where farmers can contract farm labor and where laborers can seek work.

# CHAPTER VIII - MAJOR CONSTRAINTS AND POLICY ISSUES

# VIII. MAJOR CONSTRAINTS AND POLICY ISSUES

## A. Planning Agricultural Development in Ghana

### 1. The Challenge Facing Ghanaian Agriculture:

The most current estimate of Ghana's population growth rate is 2.8 percent per annum. This means the population will double in only 25 years. This also means the population will increase from about 9.6 million in 1974 to about 19.7 million persons in the year 2000 A.D.

Ghana's urban population, total labor force and non-agricultural GDP have been projected to increase over the period 1975 to 1985 by 4.8%, 3.4% and 5.6% per annum respectively.[1]

These figures along with the projected increased food requirements developed in Chapter VII of this report clearly point to a major challenge facing the agricultural sector. Agriculture is and will be for some time, faced with the task to feed an ever increasing population, improve the quality of the Ghanaian diet, and employ a large proportion of the annual increases in the rural and urban populations. It should be recalled here that it is expected that the rural population is projected to increase by 1.6% per annum and the urban population by 4.8 per annum. In addition, agriculture will be required to supply raw materials for the industrial sector and for export to earn foreign exchange

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[1] N.L. Hicks: "Ghana Projection Model", IBRD, April 1971. A "low" level of imports is assumed owing to an anticipated foreign exchange constraint.

to sustain increases in growth and employment in the non-agricultural sector and in the overall economy.

The above indicates a formidable challenge which can only be achieved if the most appropriate and realistic policies of agricultural development are pursued. The critical challenge facing the Ghana Government is the search and identification of an agricultural development strategy which can achieve such revolutionary results.

2. Current Role and Methods of Planning

As has been discussed in previous chapters, the major instruments to bring about an agricultural revolution in Ghana have been an emphasis on large-scale, capital intensive, public production units during the 1950's and 1960's, and under the present Government the "Operation Feed Yourself Program". The former approach has been a well-documented failure. The OFY program is not a failure, but while making commendable progress on several fronts it is experiencing serious constraints on others.

To recapitulate, the initial thrust of the OFY Program was to create a national awareness of the importance of agriculture in the Ghanaian economy. It was stressed in the formative year of the program that the backbone of the economy and the present standard of living achieved in Ghana was largely due to agriculture

(and of course largely Ghana's historical dominance in cocoa exports).

After emphasising this national awareness and attempting to develop some sort of idealogical underpinning for agricultural development, the NRC basically adopted the "target approach" to agricultural planning. Reconnaissance surveys were undertaken by Regional Agricultural Officers and their staff to catalogue the major crop production activities in their respective regions. These estimates, along with supporting evidence, were forwarded to the Central Ministry for review.

The staff of the Central Ministry, on the basis of the regional crop reports then established acreage targets for the major crops grown in each region. By so doing the Ministry placed heavy reliance on the majority of farmers to extend their farms.

Land expansion among large numbers of individual farmers was emphasized, not yield increases. Given the national stock of output or yield increasing technologies, which were very limited at the time, the target approach to achieve short-run gains was the only practical option available to the Ministry within a small holder framework.

Since the initial year of OFY much more emphasis has been given to increasing crop yields. The main thrust here has been on increasing the supply of inorganic fertilizer, improved seed (mainly maize and rice) and to a lesser extent improved

planting materials (for oil palm and sugar cane) and plant protection chemicals. The commendable progress made in the multiplication of improved seed and the increased importation of fertiliser has been discussed in a previous chapter. However, given the total number of farmers, only a relatively small number of farmers are being reached with these improved inputs.

In addition to divisible yield increasing technologies discussed above the Government has imported large number of tractors and combines mainly to support the rice industry in the Northern and Upper Regions.

Basically, the role of agricultural planning since 1972 has been to identify those crops in each region for which acreage could be expanded to increase production. Secondly, regional agricultural officers developed financial request for supporting staff, vehicles, equipment, fertilisers and improved seeds. These were submitted to the Central Ministry for budget review, and subsequent allocation.

The basic method of planning has been for central administrators to set acreage targets and the various Regional Assistant Directors of Agriculture were expected to achieve their regional targets by supporting farmers through extension activities and input supply.

During the past two years for most crops (on a regional basis) about 75 - 85% of the established acreage targets were

achieved. As a result there has been an overall acreage expansion for most crops, particularly for maize, rice, plantain, and yam.

B. The Need for Multiple Planning Goals

The NRC has identified agricultural development as the major challenge facing the Ghanaian people. The GOG has an explicit goal of becoming self-sufficient in its major food requirements. The policy of self-sufficiency has been largely translated into the need to expand production *per se*.

The crucial issue for the Government and particularly the Ministry of Agriculture in the drive to increase production is the appropriateness of a strategy based almost solely on production.

A critical question which must be addressed is self-sufficiency in food production at what price?

One of the implications for agricultural planning is that an agricultural strategy must be consistent with a National Plan. A National Plan is currently in the process of being developed. There will be several specific aspects of the National Plan which will have important implications for agricultural planning.

There is evidence of major factor-price distortions in the Ghanaian economy. The extent to which these distortions are allowed to persist, or are altered by the Plan and subsequently implemented will have important impact on agriculture. The major distortions include the following:

a) High minimum urban wage rates for unskilled labor when

unemployment is increasing (over valued urban wage rates),

b) Artifically cheap capital imports when foreign exchange is scarce, (over valued exchange rate),

c) Undervalued interest rates (6%) when the opportunity cost of capital is estimated to be 15%,

d) Very high agricultural input subsidies (farmers are paying only about 15% of the cost of fertilizer) when demand is much greater than supply, and an

Macro economic policies in the forth-coming plan which will have important bearing on agriculture would include :[1]

a) A National Employment Policy,

b) Foreign exchange projections and import policies,

c) Input and product-price policies,

d) Fiscal policies,

e) Loanable funds and interest rate policies,

f) Provision of rural infrastructure and social amenities ,

g) Rural industrialization policies,

h) Land tenure policy, and

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[1]If any of these policies are not addressed in the Plan then a policy decision was made to accept the status quo.

i) The role of the public sector, and particularly the MOA, in agricultural development.

The extent to which distortions are minimized and the extent to which policies listed above are formulated in the National Plan will have important bearing on agricultural planning. The major policy guidelines for agricultural planning should be the following:

1) The extent to which agriculture will have to absorb un - and under employed labor,

2) The quantity and nature of capital inputs that will be available for agricultural production,

3) The degree to which the input delivery system will be improved and who will manage it,

4) The cost structure to be built into agriculture (nature of inputs and rate of subsidy),

5) The product-price incentives farmers will face and the ease of marketing their produce,

6) The information and extension support given to farmers to increase production and income, and

7) Prices consumers will have to pay for food.

The extent to which the National Plan defines national goals and how the Plan formulates means to achieve these goals will have important bearing on the ability of small farmers to participate and benefit in the development process. The extent to which farmers participate and increase their income will

largely determine to what extent agriculture meets the tasks of expanded food output, rural employment creation and a re-distribution of income. The extent production is increased among a large proportion of the small holders and the extent equity is improved will depend on multiple goal planning and planning agricultural development in line with appropriate national policies.

But most of all, sound agricultural planning will require a thorough knowledge of the local ecological, social and economic environment in which the small holder operates. Given that the NRC places major emphasis on small holders to achieve Ghana's agricultural requirements, it is the view of the Assessment Team, that regional development programs (which involve more than acreage targets) should be identified and implemented within a framework of a well-defined national agricultural strategy.

Agricultural Development Programs must be planned and implemented on a regional basis because land-use and cropping patterns vary among ecological zones. An important implication of this is that current production systems, the resources used in these systems and the productivity of specific resources vary among ecological zones. (It should be recalled that 9 ecological zones have been identified in Chapter III.) Given the variation

in relative factor endowments, cropping patterns and regional agricultural priorities, improved production practices and improved farm technologies will also vary among the ecological zones.

The above implies a well conceived regional-based planning effort. It further implies a "grass-roots" knowledge of the prevailing production systems and the on-farm and off-farm production constraints facing small holders in each region. At the same time a national agricultural strategy and plan is required to ensure the following:

1) That regional strategies are consistent with national goals and priorities.

2) That professional manpower, funds and resource requirements are identified and appropriately allocated among regions.

3) That sufficient resources are allocated among the key functions or problem solving areas such as planning, agricultural research, extension services, manpower training, input delivery systems, storage, credit, etc.

C. Need For Appropriate Statistics For Planning.

The role of agricultural statistics is three-fold. First, statistics in a general sense serve to define the physical, social and economic environment of the target group under investigation. Second, they assist with the identification of constraints which impede movement or progress toward some more desirable state of affairs. Third, the collection and analysis of the information provides the necessary baseline data against which actual and planned outcomes can be measured.

Any program of change should be based in part upon an accurate definition of the problem(s) and the constraints to achieving the desired outcome. A planning strategy focusing on the national, regional, or local level requires the collection of accurate and useful statistics against which realistic planning can be done.

Compared to other African countries Ghana appears to have a relatively better data base, at least with respect to general census information. However, the agricultural statistics do not go much beyond the number of holders, number of farms, acreage under various crops,

yield and production estimates. The major void in agricultural statistics is estimates of costs of production among technological systems for various major crops. Also, lacking is data on the economics of inter-cropping and the production constraints faced by small holders. No information appears to exist on the small holder decision making process, or his production and consumption priorities. There is very little information on the demand for hired labor and the nature of farmer's off-farm activities. These data gaps must be lessened in the near future if better planning and implementation is to be realized and if desired objectives are to be achieved.

The Sample Census of Agriculture and the subsequent current Agricultural Statistics Reports do provide useful aggregate agricultural data. However, planning agricultural development also requires extensive micro-economic data (farm level) among farmers producing different crops, utilizing various production systems, using different quantities and qualities of capital and labor, and producing under different ecological conditions.

In order to obtain the data presently required by agricultural planners expanded full

research programs are required. There is a critical need to expand production economics and farm management research in Ghana. This research should be undertaken among small holders who have multiple crop enterprises and who are engaged in inter-cropping and mono-culture practices.

Immediate efforts should be undertaken by donors, in colloboration with the universities and the GOG, to greatly expand the farm research capacity in Ghana. The research program should be of a multi-disciplinary nature and oriented toward identifying critical farm production constraints, and solving current production problems among small holders.

The College of Agriculture at the University of Legon and the Institute of Social, Statistical and Economic Research have a very important role to undertake in this area and should be supported by donors if ways can be found to assist them to expand their field research programs.

D. The Public Role in Agricultural Development.

A sound agricultural/rural development strategy for Ghana will require the effective implementation or improvement of several

supporting services. These would include the following:

- input distribution
- agricultural extension

socio-economic research

- selection and dissemination of appropriate agricultural technologies
- crop and soil research

- improved agricultural administration and management
- on farm and terminal storage facilities
- expansion of feeder roads
- improved product marketing
- provision of rural social amenities

These supporting functions or services should be planned and implemented within a national framework. Some of these are appropriately national supporting services. However, all require regional focuses and implementation. The regional emphasis and organisational thrust will only differ on the basis of relative requirements or priorities and the degree to which the above are sequenced and integrated.

One of the main issues in this area is to what extent these supporting services should be implemented and carried out in the public sector as opposed to the private sector.

In Ghana agricultural extension, regulatory services,

infrastructural support, most input distribution, and research are within the public sector. Also during the 1960's and to some extent today the Ministry of Agriculture is involved in direct production activities. The Food Distribution Corporation and the Grains Development Board (both public institutions) are involved in agricultural product marketing although these public production and marketing activities are relatively unimportant compared to the private sector.

To undertake efficiently this wide variety of functions requires effective planning and implementation, large quantities of working capital, well-trained management, and competent supporting staff at all levels. It is our view that the public sector and particularly the Ministry of Agriculture has taken on a greater task than it can effectively handle given the resources at its disposal and the increasing demand for these services. These tasks will increase with time.

The implication is that more of these functions should be turned over to the private sector. For the private sector to respond to public needs the public

sector should not involve itself in a competing role but should establish policies and financial incentives, so that private firms will find it attractive to invest in agricultural input supply, product marketing, agricultural implement design and manufacture, crop storage and product marketing.

The role of the Ministry of Agriculture should then be:

1. Agricultural Planning
2. Rural Extension
3. Product and price forecasting
4. Research
5. Regulatory services (grading)
6. Functional and Institutional coordination

In addition the public sector should support rural development by providing feeder roads, rural water supplies, other social amenities, and supporting small-scale rural industrialisation.

## E. Selection of Improved Farm Technology For Small Holders.

### 1. Macro Issues.

"Selection" of agricultural technology implies; first, there is a choice that can be made and second, there is a basis (criteria) upon which to make choices.

A problem which faces countries like Ghana is that improved technology available in the world market place has largely been developed for quite different relative factor endowments and production systems than exists in the developing countries. With the exception of improved seed and inorganic fertiliser most available agricultural technologies require large land areas in order to be viable, and a large financial investment and stock of working capital on the part of the owner.

Given the present and projectal Ghanaian foreign exchange position, the nature of most farm production units, the production practices in current use, and the financial resources of most small holders, many or most of the improved/advanced foreign developed farm technologies do not hold much promise for Ghana at least in the foreseeable future.

The national policy issues discussed in previous sections have a great bearing on the selection of appropriate agricultural technologies. The present and prospective size of the farm labor force, availability and allocation of foreign exchange, the magnitude and basis of allocating loanable funds, and fiscal policies to mention a few all have bearing on this issue.

Given the above and the population and food production projections developed in this report it is clear that a small holder production strategy is required. Given the present state of the arts in the small holder sector and the macro-economic constraints that Ghana faces it is imperative that improved farm technologies be complementary to labor (i.e., not labor displacing) and can increase the productivity of labor. It should be clear that policies must be formulated which will encourage the absorbtion of labor into farming activities and at the same time increase the productivity of labor because farmers will be required to produce for ever increasing numbers of people.

The macro issues indicate a set of criteria to be used in the selection of technology. But appropriate

selection and actual use by small farmers will depend in part on issues at another level.

2. Farm Level Issues.

Small holder agriculture is predominately characterized by a system of inter-cropping. The rotational systems, fallow practices and crop associations are extremely complex and variable among regions and ecological zones. The selection of improved technologies for this target group will require an acknowledgement and understanding of the complexity and ingenuity in the ways the small holder has adapted to and manages his environment. Moreover it requires an understanding of the social environment within the context of the extended family and the farm as well as non-farm activities performed by various family members. This will require an understanding of the family as a production and a consumption unit and how priorities are established and various functions are performed.

It is the hypothesis of the Assessment Team that developing an improved technological input or input package which will be adopted by large numbers of small holders will require learning and ultimately far more knowledge than is currently known about this target group.

At present there exists very little information on the output and income increasing effects of any mix of divisible technologies which if disseminated would bring about an increase in food production on a small-scale holding where inter-cropping is practical.

## F. How To Reach Small Farmers

### 1. A Starting Point.

It is the hypothesis of the Assessment Team that in order to obtain widespread participation and major productivity advances among small holders a thorough knowledge is required about the physical, economic and social environment on which small holders operate. This task will require (1) more precise knowledge about local farm and off-farm practices and constraints than is presently known and (2) from a programing point of view accepting a price for the time required in learning and the need for sequential programing and funding.

### 2. Knowledge Required.

The following information will need to be acquired over-time about small holders:

a) An identification of the technical variables that influence intercropping and rotational decisions and patterns;

b) Determining how much disposable family, communal and hired labor is available and what restrictions there are to increasing their utilization;

c) Importance of farm and off-farm activities as sources of real income and their relative returns;

d) Identification and description of on-farm and off-farm production constraints;

e) Division of labor among the sexes for farm and non-farm activities;

f) Labor requirements for various crops, crop mixtures and field activities;

g) Production and consumption priorities and decision making processes (ie., production, consumption and income goods);

h) Identification of non-local (ie., regional and national) production constraints which post obsticles to small holders.

Most of the above information is either not known about small holders or very little is known about them and their interrelationships. One of the remarkable facts about small holder farm production systems and particularly intercropping is that the system(s) result on relatively high productivity per unit of land and labor given the bundle of resources at the disposal of the farmer, while at the same time minimizing the risk of crop failure and resulting starvation.[1/]

3. Needed Redirections.

Morss and Sweet[1/] have derived some very important conclusions about development projects and requirements for effective small holder oriented programs. These are:

a) "When projects are not specifically designed for small farmers, most appear to be of little use to them,"

b) "Small farmers have played an important role on the "design teams" of nearly all projects that have provided significant benefits to small farmers."

c) "Getting the benefits of development to the small farmer on a way that will become self-sustaining will be more difficult, administratively most costly, ⟶

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1/ One is reminded of Schultz's efficient but poor" thesis.

1/ Elliott R. Morss, Donald R. Mickelwait and Charles F. Sweet. "Implementing The U.S. AID-McNamara Mandate: What Big Foreign Donors Can Do About Getting the Benefits of Rural Development To The Small Farmer." Memo Development Alternatives, Inc., Washington, DC, 1974.

more time consuming and will involve more political problems than achieving the earlier development objective of increasing aggregate agricultural output."

d) "Getting the benefits of development to the small rural producer in a manner which can become self-sustaining will require fundamental changes in project identification, design and implementation procedures of US/AID and other external donnors."

e) "It is required that small farmers are involved at the outset in project design, assist in evaluating and modifying project activities and to receive sufficient benefits so they commit their own resources.

f) "Avoid centrally controlled national programs which build expectations and then fail because of local constraints.

g) The key to rural development is to start with something simple which is determined to be desired by the target group, then over the next 1-2 years determine what might further be done.

h) It is the complexity, speed and design of project activities at the local level that are the critical factors to this approach not the number of localities being assisted.

i) The small farmers reaction to a new technology can not be anticipated without a detailed understanding of his objectives and the constraints he works under.

To obtain the above knowledge will require developing an inventory of current knowledge available in Ghana. These sources would include universities, ministries, extension workers research institutes, etc. But it will also require drawing upon external institutions like IITA at Ibadan, the RSRU at Zaria, TAB/Aid Washington, foreign universities, etc. But much of the information will come from local field observations, and interviews and expanded multi disciplinary research at the village/farm level.

# CHAPTER IX - POSSIBLE ROLE OF EXTERNAL DONORS TO ASSIST AGRICULTURAL DEVELOPMENT IN GHANA

# IX. POSSIBLE ROLE OF EXTERNAL DONORS TO ASSIST AGRICULTURAL DEVELOPMENT IN GHANA

## A. Overall Strategy Options.

A precise definition of the role of the external donor in Ghana is not clear at the present time, but it is hoped that the forthcoming National Plan will define the forms and the areas of assistance which will be sought by the GOG. However, certain assumptions can be made. These are based upon the current activities of external donors in Ghana, newspaper articles, speeches made by government officials, personal communications, the apparent goals of the GOG and the domestic resources available to achieve the targets set for agriculture. The major assumptions are the following:

a) Agriculture is a priority sector;

b) There is a strong desire to stimulate rural development;

c) Much of the increased food production must come from smallholders;

d) The GOG is searching for an effective program to implement among smallholders;

e) The Government desires to increase food production and improve its internal distribution;

f) Increased food production must be available at prices which allows the broad-base of society to purchase its food requirements;

g) There is not sufficient domestic resources available to achieve these goals and foreign assistance will be required.

Unil the Government articulates the form in which it will accept foreign assistance the donors have several strategy options available; it is likely these options will not change even after the plan is formulated and published. It is more likely the direction or focus a donor might be requested to assist the GOG will fall within one or more of the following strategy options.

1. The Conventional Project Approach.

This approach includes a wide range of projects which focus on the development of a particular crop, most commonly export crops or import substitutes. Projects are generally implemented by semi-autonomous units. They have the objective of increasing output per participant, who may either be large-scale or small-scale but are almost always innovators and, therefore, the relatively richer farmers. Participants are induced to join the project because of the high financial returns to the farmers of a new technology. The limiting factor is usually capital in fixed or non-fixed forms and provisions in the project are made to overcome these constraints.

Net project benefits are defined in the narrowest sense to assure that the economy can bear the financial burden of repayment schedules with minimum adverse effects on debt servicing capacities. They have been limited by a low degree of replicability to a broader base of participants, and by a low degree of exploitation of essential complementarities. Recently, these projects have become more comprehensive and basic supporting activities such as research, product marketing

and essential infrastructure have been integrated into the project. These projects have resulted in relatively high social costs per participant, and therefore, are limited in their replicability on financial grounds.

Examples of these projects in Ghana are the IBRD sponsored livestock, oil palm, cotton, sugar and cocoa rehabilitation projects.

2. National Program or Sector Support Approach.

"National program support," or balance of payments support and the Sector Support approach are similar except the latter focuses assistance to a particular sector of the economy (i.e. industry, agricultural, tourism, etc.), and usually on a specific problem area within that sector (i.e. marketing, input distribution, credit). The sector approach may include local currency support but more commonly provides only foreign exchange support. Sector loans are controlled by Finance Ministries, and can be used either for general budgetary support of on-going programs and/or support of new programs. The sector loan may be supplemented by additional grants to cover foreign exchange costs of additional investments. Activities commonly supported range from planning, research, input distribution, output marketing, training, and regulatory services. These activities are implemented on a national basis through existing institutions. They require little incremental expatriate staff. They are generally not geared to a particular target group or groups of potential beneficiaries. The incremental benefits of these activities are vaguely specified and they are difficult to evaluate in terms of their overall impact . The sec-

tor support approach has theoretical advantages over the project approach in that it may have a broader base impact, lower cost per beneficiary and can be more easily integrated with new and/or on-going supporting activities on a national basis. Examples of such activities in Ghana are the USAID-sponsored fertiliser, and manpower training programs.

3. Testing a Development Hypothesis.

Project activities under this category focus on the diffusion of improved inputs and cultural practices in a particular area(s). The technical, social, and economic feasibility of the improved technologies typically are not locally tested or adapted beforehand. They are disseminated on the presumption that they will work because they have worked elsewhere; or it is assumed the new technologies will solve key constraints to increases in agricultural production or rural standards of living. The projects are implemented largely by expatriates or overseas institutions in local areas; they are only closely, if at all, coordinated with local institutions, on-going work programs and requisite supporting activities. They are seldom evaluated, costs and benefits are seldom quantified but a specific target group or problem area may be identified.

Working parallel to existing institutions, their "success" is critically dependent on the management capability of expatriate staff. They frequently lack planning, budgetary and manpower support from host country institutions, and are usually terminated upon withdrawal of support from overseas resources. They have several advantages over ap-

proaches #1 and #2. They are experimental and useful testing grounds for the impact and diffusion of new technologies and practices at local levels. If monitored and evaluated they can provide valuable insights into the factors underlying success or failure, and could provide guidelines for possible replication. They could provide the basis for integrated rural development programs if implemented and coordinated through local institutions.

While they do not clearly fit in this category examples of this approach in Ghana include the USAID Focus and Concentrate Program (in which USAID is no longer involved) the Canadian borehole drilling program, the CFTA Cotton Program in the North, and the German Fertilizer Project in the Northern and Upper Regions during the initial years of the project. The activities of various religious missions also fall into this category.

4. Rural Development and Learning By Doing Approach.

This approach differs from #3 above in three respects.

First, activities are focussed on a particular geographical area, either an ecological zone or administrative region; second, they are implemented through local institutions, and third, they are not based on any preconceived notions or presumptions about either the feasibility of new techniques or the constraints (and their solutions) to increasing rural living standards. A project area is typically identified after a multi-disciplinary team has undertaken a preliminary study of the area's structure, climate, resource base, agricultural potential and developmental constraints. Usually a single

project activity (e.g., provision of fertilizer) is identified as an area requirement. The project is then established to perform this function. While the function is being implemented the project undertakes further study (learning) to identify other, or more important, developmental constraints in the project area. As these are identified new project activities are built into the project. Often applied or practical testing of tools, equipment, structures and crop trials are carried out under actual farm conditions.

High level project staff are predominantly nationals with an expatriate manager and other expatriate staff in advisory roles. Their success is primarily based on effective coordination between various local institutions under the umbrella of an implementing mechanism in which full responsibility and authority is vested. Over time, expatriate staffing decreases and project components become more numerous and their net incremental benefits increase with integration and exploitation of complementarities. Project costs are low through the planning phases, increase with learning and implementation of additional project components and over time decrease on a cost per beneficiary basis.

There are few examples of this approach in Ghana, However, the Ghanaian-German Agricultural Development Project in the North and to a lesser extent the UNDP Cooperative Maize Improvement Project, fall into this category.

Despite the attractiveness and advantages of this approach, the rural development or "learning by doing" approach has several dis-

advantages which must be taken into consideration. First it is difficult to justify from a programming point of view because components, activities, technologies and their pay-offs (over time) cannot be specified before budget appropriations and implementation . Second, there is no guarantee that the planning/research phase can develop components which can be justified even in broad social accounting terms. Third, there is a lack of overall criteria for the selection of an appropriate project area. Fourth, it may tie up scarce host country resources in a confined geographical area during the planning/research phase when they can be more productively used elsewhere (unless,of course, a donor bears these costs). The extent to which these limitations apply and are important in Ghana cannot be rigorously determined here and would have to be discerned in future discussions with Ghanaian officials. However, the Assessment Team believes USAID should as part of its program of development assistance move in this direction.

B. Options For USAID Assistance to Agriculture.

1. Introduction

The chart on the following pages attempts to summarize the major constraints in Ghanaian agriculture as they have been identified by the Assessment Report. We have attempted to identify the problems, causes and effects of each sub-sector constraint. The discussion and recommendations which follow are based upon this chart.[1/]

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1/ The Chart should not be evaluated in isolation of the report. The Chart "falls out of" the report and as such does not show the supporting evidence and analysis which can be found in the body of the report.

CHART A: MAJOR AGRICULTURAL SECTOR CONSTRAINTS

| SUBSECTOR | PROBLEMS SYMPTOMS | UNDERLYING CAUSES | EFFECTS | RELATED SUBSECTORS |
|---|---|---|---|---|
| 1. Product Marketing | - Increasing seasonal price fluctuations (farm, wholesale retail)<br>- Rising Consumer food prices<br>- Seasonal unavailability of selected foods | - Poor feeder road network<br>- Aging vehicle fleet and inadequate quantity<br>- Unrealistic product price policies<br>- Inadequate working capital in the system<br>- Inadequate storage facilities (on-farm, assembly, terminal) | - Disincentive to producers to expand production<br>- Inadequate inter- and intra-regional trade<br>- Incentive for smuggling and wholesale and retail hoarding | - Farm Production<br>- Transport<br>- Credit |

| SUBSECTOR | PROBLEMS SYMPTOMS | UNDERLYING CAUSES | EFFECTS | RELATED SUBSECTORS |
|---|---|---|---|---|
| 2. Public Administration of Agriculture | - Lack of an Agricultural Plan or Development Strategy | - Frequent reorganization of the MOA<br>- Constant drain of well trained personnel from the MOA<br>- Low standard of management and administrative skills<br>- Inadequate Planning staff in agricultural institutions<br>- Profusion of new public institutions organised on a single crop or functional basis | - Poor communication among agricultural institutions<br>- Lack of coordination between functional groups (i.e., research and extension)<br>- Little knowledge of how to improve smallholder agriculture | - Manpower Training |

| SUBSECTOR | PROBLEMS SYMPTOMS | UNDERLYING CAUSES | EFFECTS | RELATED SUBSECTORS |
|---|---|---|---|---|
| 3. Smallholder Production Units | - Little technological progress among smallholders | - Lack of knowledge of:<br>- current production systems<br>- production and consumption priorities<br>- decision-making process<br>- resource base and needs<br>- incentives required to innovate<br>- Central planning (from above) without adequate farm data<br>- Inadequate local planning directed toward target group. | - Little knowledge of how to plan technological change among target group<br>- Meagre research results about smallholder production systems for planning purposes | - Research<br>- Extension<br>- Marketing<br>- Input distribution |

| SUBSECTOR | PROBLEMS SYMPTOMS | UNDERLYING CAUSES | EFFECTS | RELATED SUBSECTORS |
|---|---|---|---|---|
| 8. Rural Labor Force | - Under utilisation of labor<br>- Rural/urban migration<br>- Seasonal unemployment | - Inadequate technological change among smallholders<br>- Unidentified improved labor intensive techniques<br>- Long dry seasons in many farming regions<br>- Inadequate off-farm employment opportunities<br>- Inadequate provision of rural social amenities<br>- Unidentified output increasing technologies for intercropping production systems | - Low rural incomes<br>- Lack of year round employment opportunities | - Smallholder agriculture<br>- Industry<br>- Transport<br>- Research<br>- Marketing<br>- Manpower Training<br>- Credit |

USAID's agricultural assistance strategy in Ghana has to be defined in the context of a Congressional Mandate and recent policy statements of the GOG. Both emphasize the involvement of a large proportion of smallholders in a development program. Theoretically, USAID could satisfy the Congressional Mandate and GOG policies under any one of the strategy approaches outlined inSection A above, provided that the approach singled out the smallholder as the target group.

Presently, USAID's assistance to agriculture can be categorized under the National Program or Sector Support Approach. Current areas of assistance include fertilizer (the feasibility and phasing of plant facilities and national fertilizer distribution), an improved seed program (a proposed seed development program awaits discussion with GOG officials), an Agricultural Management Development Program for senior staff in all the administrative regions. Although these are important areas of sector assistance, particularly the Management Training Program, they are not in themselves the most critical mechanisms for reaching or involving the smallholder in the development process.

The Seed and Fertilizer assistance programs assume that smallholder agriculture is primarily based upon pure stand cropping and that smallholders will readily make the decision to adopt (and will have the financial means)improved seed and fertilizer. These assumptions are probably valid in the case of large farmers and smallholders who produce rice, and to a lesser extent maize, in pure stand. Rice and maize is produced in pure stand in many parts of the country but a large

proportion of the smallholders tend to intercrop maize with other crops. Most other crops are produced in an intercropping system.

As has been pointed out in previous Chapters there is little research on the response rates of fertilizer and improved seeds under mixed cropping conditions; there is no effective input distribution program coupled with a credit system for the small-scale farmer. Further, there is little information inGhana setting forth the conditions under which a smallholder would be induced to switch from a mixed crop to a pure crop situation. These factors point to other priority areas if the smallholder is to actively participate in the development process.

2. Options.

If major progress is to be achieved by the agricultural sector and if smallholders are to be actively involved and benefit, there are four sub-sector constraints which must be tackled (See ChartA, p.256). These sub-sector constraints point to priority areas for U.S. assistance to Ghanaian agriculture.

The Assessment Team believes the two major overall priority areas are product marketing and regional agricultural development.

Improvements in the Marketing System.

There is evidence that smallholders are producing significant marketable surpluses, but are unable to readily sell their output, particularly at stable and reasonable prices. In order to have the necessary incentive to expand output, adopt new technologies, hire more labor, etc. farmers require better marketing arrangements. Part of the problem is that traders do not have ready access to many farming areas or the means to get into these areas to evacuate farmers' produce. There is evidence

of relatively high on-farm losses of food due to the inability to sell at harvest or properly store the surplus (on-farm) until a time when roads are passable, or market prices are higher.

As shown in Chapter II there are wide price differentials among regions for particular crops and radical price fluctuations over the year. These fluctuations have become more pronounced in recent times.

The Assessment Team believes that the product marketing system has not kept pace with increases in production in recent years. If major improvements are not made in the marketing system in the very near future, producer discentives will be strong and inevitable. The following are the improvements required:

- a more extensive feeder road network;
- larger vehicle fleet to transport agricultural products;
- improved on-farm storage;
- expanded terminal market storage facilities;
- improved product price policies, and
- improved inter-regional trade.

The immediate problem is not low aggregate agricultural production but rather an inadequate evacuation and food distribution system. Another major food problem is the starch-grain ratio which has been discussed in Chapter VII. To reduce losses due to storage, improve internal food distribution, and encourage expanded farm output (which as our projections show will be increasingly required) an improved product marketing system is a top priority.

We therefore, recommend that USAID pursue discussions with the GOG on this topic to determine if U.S. Assistance would be desired. If a positive reaction is received then we recommend that USAID hire a consulting team to study the marketing system to determine what specific assistance USAID can offer the GOG in this area. The study should be undertaken in the very near future and appropriate assistance follow shortly after. Future USAID activities in the marketing area are consistent with AID's Sector Support Approach. Specific activities could be funded by the proposed Agricultural Sector Loan.

Another major area for U.S. Assistance is a <u>regional small holder development program.</u> Throughout the assessment we have identified the importance of the small holder. In addition we have shown the complexity of the environment in which the farmer operates and how the small holder has ingenuously adapted to his environment through the practice of intercropping and crop rotations. We have pointed to what little is known about small holders (their resources, decision-making priorities, production constraints, etc.). We have indicated that we know little about the conditions under which small holders will adopt new innovations, such as switching from intercropping to mono-cropping. (We do not know if the latter is desirable).

As far as we have been able to determine, the current state of knowledge does not give sufficient assurance that a change agent can readily identify and diffuse a package of modern technologies to Ghana's smallholders. We do suspect, however, that there are several rather humble measures that smallholders might adopt in the short-run to increase their production. These might include:

a) better fallow and rotational practices;

b) improved hand-tools and simple implements;

c) improved on-farm storage facilities;

d) credit to hire labor during peak seasons;

e) better access to rural markets, and possibly

f) minimum tillage techniques

The general lack of knowledge and the uncertainty about the above list strongly implies the need for a regional agricultural development program along the lines of the "learning by doing" approach described earlier. It is also believed that research, planning, programming, coordination and implementation of this type of approach will have to be done on a regional basis.[1/]

We are not suggesting starting-off with a full-fledged rural integrated development program. This would be the ultimate objective, if initial involvement shows success. What we do suggest, however, is to select an area, determine an appropriate activity that would benefit the smallholder in that area (i.e. identify and solve one or more of his present constraints), implement the program and at the same time search or learn about other local constraints (farm or off-farm) which could then be integrated in the program.

The thrust is not on a particular input or crop, but rather on communities and how communities of smallholders can raise their production and income and ultimately the level of living. The success of this approach will depend largely on learning about and identifying real local constraints (abandoning preconceived notions to a large extent), and also identifying

1/ Also see the selection "How to Reach Smallholders" Chapter VIII.

ways in which smallholder communities can and will mobilise their own resources to contribute to the planning and costs of the program.

If USAID were to supplement its present national program and sector support activities with a regional development activity then the following steps would be required:

1. Discussion with GOG officials to obtain overall agreement on the concept and approach;
2. Assist GOG in developing criteria for selection of a region;
3. Determination of GOG and USAID manpower and financial resources to implement the planning/research phase of the regional development project;
4. Determination of the nature and sequencing of supporting activities, from national institutions such as MOA, CSIR, ADB, PWD, FDC, etc;
5. Determination of appropriate mechanism to plan and fund the initial and subsequent phases.

The major obstacle for USAID, assuming that overall agreement can be reached with GOG on such a proposal, would be how to rapidly identify an activity and a physical entity to start with, and around which future components of a regional development program can be planned and budgeted. To this end it appears that two mechanisms will be required. First, it is recommended that USAID post a techni-

nical assistant (direct hire or contract) to the Regional Planning Office in the region selected, and another technical assistant to the Regional Ministry of Agriculture Station. The two persons would in collaboration with the staff of both institutions plan the proposed program. In this manner the program would be locally oriented and at the same time integrated with existing local institutions.

In addition to the above personnel it will be important to establish a small experimental farm institute which will be solely oriented toward practical field trials, testing and possibly designing simple farm equipment and structures. Included in the trial program would be seed, fertilizer, crop mixture and rotational-trials under actual smallholder farm conditions (i.e., not under experiment station conditions). The work of the farm institute would be exclusively devoted to smallholder farm conditions and would be designed to solve identified smallholder production constraints.

The institute farm should be coordinated with the Regional Office of the Ministry of Agriculture and staffed by the MOA, and CSIR. It may be necessary to place one AID technical assistant at the farm institute for the initial development of institute and its program.

USAID's involvement would thus be in both the planning and implementation of the regional development program. It would involve

technical assistance and financial support. Financial support would be largely in the form of foreign exchange support, and technical staff, but should also contribute to local currency costs.

The Assessment Team is not qualified to be more specific on the planning and implementation of this program. It is hoped that this area of AID involvement will be given serious study and discussion with GOG officials.

It is anticipated that parts of the proposed Agricultural Sector Loan can be utilised to cover foreign exchange costs and some of local expenditures. The foreign exchange costs could, and probably should be grant funded. Financing and staffing arrangements would be relatively long-term to insure the program developed to a point where it could provide long-term benefits to smallholders and develop into a self-sustaining program.

Another major agricultural sector constraint identified in the Chart on page 257 is ublic Administration of Agriculture. USAID has embarked upon an Agricultural Management Development Program which it is anticipated will do much to overcome many of the problems listed in the Chart, under this heading. It is our judgment that this is a well conceived program and should be given continued support by USAID. At the present time the Assessment Team sees no further involvement in this area, unless USAID was requested to again assist with national agricultural planning. While this latter area is a crucial problem in the Ministry of Agriculture and should be pursued if the opportunity should develop, it does not

appear to be an option open to USAID at this time.

It is quite possible that has a result of the Agricultural Management Development Program there may be a request for USAID assistance to the Agricultural Extension Service. But we would not place this as an immediate priority. It is well known that the Extension Service does not perform well. Many approaches have been tried to improve the service (e.g., The Focus and Concentrate Program) but none have succeeded in making any real impact. It is possible that the Agricultural Management Development Program will be able to get a handle on the problem(s) within the ExtensionService. If this turns out to be true, then another viable option for U.S. assistance to agriculture will be open.

The fourth sector constraint which the Assessment Report has identified deals with the <u>under utilization of the rural labor force.</u> (p. 259) It is believed this area will largely be tackled with formulation of appropriate economic policies which encourage:

a) Smallholders to expand the use of hired labor (e.g., seasonal agricultural credit, identification of output increasing and labor intensive field techniques);

b) Expansion of feeder roads in the off-season depending largely on self-help projects;

c) Provision of social amenities in rural areas using labor intensive techniques;

d) Rural small-scale industrialization;

e) Slowing down on the rate of increase in large-scale tractor mechanization.

The above list is not exhaustive and there are undoubtedly other policies which could assist to achieve greater utilization of rural labor.

3. Summary

There are complementaries among improved product marketing, expanded farm output, improving the administration and management of agriculture and mechanisms to increase the utilization of rural labor. It is therefore anticipated that assistance within the strategy options identified in this report would contribute to: 1) increasing the labor absorptive capacity of the rural sector, 2) increasing farm output among smallholders, and 3) increasing the income and level of living of rural residents.

# THE ROLE OF WOMEN IN GHANAIAN AGRICULTURE
## A Preliminary Overview

## 1. Introduction

Since time immemorial Ghanaian women have played an active role in rural life performing not only numerous household and child care duties but farming, trading, portage, food processing and others. The traditional role of women in fact probably places a disproportionate share of the burdens of the total household on her shoulders. But in any case it is clear that any analysis of agriculture needs to give some attention to the role and functions of women, the constraints they confront and the means which may be made available to enhance their contribution to its development and to assure equity in the distribution of its product.

## 2. Female Employment in Agriculture

### 1. Country-wide Information

Table I shows that in 1970 the potential labor force (i.e. the population over 15 years of age) had grown by 813,000 since 1960. It is interesting to note that the increase in females is significantly greater than that of males. This may be explained by the Aliens Compliance Order of 1969 which resulted in several thousand foreign-born males leaving Ghana.

Of the total employed, the increase in females employed from 1960 - 1970 is far greater than that for males. This may be explained in part by an increase in education and information among women, and hence a greater willingness among women to work. It may also reflect a financial need that has forced women to seek employment.

The increase in women employed in agriculture (1960 - 1970) is also far higher than the increase in males. In fact, the increase in the number of women employed in agriculture explains 92% of the increase in the total increase of persons employed in agriculture. This may be explained by the fact that males are increasingly attracted to alternative forms of employment, such as wage employment in the urban areas, leaving women to take up the slack arising from the increased demand for agricultural produce.

However, less easily explained is the increase in the female share in the increase in those employed in non-agricultural industries. This female share is 63.2% of the total increase. Not only this, but the number of additional women in non-agricultural industries is higher than the additional number of women employed in agriculture. Answers to the intriguing

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TABLE 1

EMPLOYMENT STATISTICS, GHANA POPULATION 1960, 1970

| | 1960 000's | 1970 000's | Absolute Change 000's | Annual Growth Rate % |
|---|---|---|---|---|
| TOTAL POPULATION OVER 15 YRS. | 3,730.3 | 4,543.3 | + 813.0 | 1.99 |
| FEMALE | 1,845.8 | 2,316.3 | + 470.5 | 2.30 |
| MALE | 1,884.5 | 2,227.0 | + 342.5 | 1.68 |
| TOTAL EMPLOYED, ALL INDUSTRIES | 2,559.4 | 3,133.0 | + 573.6 | 2.04 |
| FEMALE | 991.4 | 1,415.1 | + 423.7 | 3.62 |
| MALE | 1,568.0 | 1,717.9 | + 149.9 | .92 |
| TOTAL EMPLOYED, AGRICULTURE | 1,581.2 | 1,790.8 | + 209.6 | 1.25 |
| FEMALE | 578.9 | 772.7 | + 193.8 | 2.93 |
| MALE | 1,002.3 | 1,018.1 | + 15.8 | .16 |
| TOTAL EMPLOYED, NON-AGRICULTURE | 978.2 | 1,342.3 | + 364.1 | 3.21 |
| FEMALE | 412.5 | 642.5 | + 230.0 | 4.53 |
| MALE | 565.7 | 699.8 | + 134.1 | 2.15 |

Source: 1960 & 1970 Census

question as to the type of work of these women is beyond the scope of this preliminary report. However, it is hoped to examine this question in future.

Of the 2,316,300 women over 15 in 1970 33.3% were employed in agriculture. It is likely however, that a far higher percentage of women over 15 undertake at least part-time activities in agriculture. Such women may have declared their primary occupation as either trader or home-maker, but most interviews have suggested that most women even in the urban areas, do undertake work on their family's farms. It should also be noted that both censuses collected data in March, a time in the agricultural year when farming activities in most areas are at a low ebb.

2. Regional Differences

Table 2 shows a significant difference in the activities of women between North and South. In 1960, only 18.6% all all women over 15 years of age in the North were employed at all, compared to a figure of over 65% for all the Southern Regions. (Brong Ahafo, a transitional zone, ecologically and agriculturally, had 48.4% of its adult women employed.) This difference may well be explained by the fact that many Northern people are Moslems, and keep their women secluded. It is significant to note, however, that this practice appears to be declining somewhat, as by 1970 over 29% of Northern women were employed, and 71% of women in Brong Ahafo.

In 1960 at least 50% of all women employed were employed in agriculture in all regions, with the Western and Ashanti Regions accounting for the highest numbers. It is interesting to note that although total employment of women in all regions increased from 1960 - 1970, the percentage employed in agriculture decreased in some areas, most notably in Brong Ahafo and the Northern Regions.

In the later paper a detailed breakdown of information by regions will be presented, and, it is hoped, at that time to account for some of the quite startling changes that seem to have taken place in the Northern areas from 1960 - 1970. The later paper will also relate the activities of women in agriculture to the ecology of each region, the ethnic background of its people, and the type of crops produced.

For the meantime, it should be borne in mind while examining country-wide information, that Ghana is a country of great ecological, agricultural and ethnic diversity.

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TABLE 2

FEMALE EMPLOYMENT BY REGION, 1960, 1970

| REGION * | TOTAL WOMEN 15 YRS. & OVER | | % OF WOMEN EMPLOYED | | % OF WOMEN EMPLOYED EMPLOYED IN AGRICULTURE | |
|---|---|---|---|---|---|---|
| | 1960 | 1970 | 1960 | 1970 | 1960 | 1970 |
| Western | (377,050) | 199,933 | (66.7) | 69.0 | (60.7) | 60.5 |
| Central | | 250,596 | | 76.3 | | 62.7 |
| Eastern | 294,120 | 337,222 | 65.3 | 69.1 | 54.4 | 54.7 |
| Volta | 221,640 | 267,203 | 66.1 | 72.1 | 50.0 | 54.8 |
| Ashanti | 282,600 | 376,091 | 65.2 | 68.4 | 68.5 | 64.2 |
| Brong Ahafo | 143,690 | 188,447 | 48.4 | 71.4 | 82.7 | 77.8 |
| Northern | (391,900) | 197,554 | (18.6) | 29.9 | (70.4) | 41.4 |
| Upper | | 272,105 | | 29.7 | | 42.4 |

Source: Census Data 1960/1970

* In 1960 Western and Central Regions were both included in Western Region and Northern and Upper Regions were included in Upper Region. Accra District has been omitted since this region is predominantly urban.

3. Type of Crops

In 1960, of the 1,002,339 women employed in agriculture, 71.3% were involved in the growing of field crops and foodstuff production, including vegetables, flowers and mixed farming. This compares to a figure of 44.3% of males in the same activity. Almost 26% of women in agriculture were cocoa growers, as opposed to 37.3% of males. The next most important agricultural area for women is coffee, where 8,750 were employed. Females predominated in oil-palm production, but the total number involved was only 1,910. In the next paper it is hoped to compare these figures with those for 1970.

4. Status of women in the economically active population in agriculture

Table 3 suggests that a majority of women in agriculture are farmers in their own right. This picture may, however, be slightly misleading. Interviews with field-workers and researchers suggested that it is common for a woman who operates on her husband's holding as a family worker, to have a small farm, or field of her own, on which she most typically grows vegetables (okro, garden eggs, alafo, for example), pepper or other food crops. Since the census question did not allow for a positive response in more than one category, such women may well have classified themselves as self-employed, while spending a significant amount of their time as a worker on the family holding. On the other hand, a 1968 study revealed that 26% of all household heads were females. It is to be expected that some of these female heads are rural widows and divorced women who have no other livelihood than farming, and that some of them are also farm women whose husbands have gone to the urban areas to seek wage employment.

Since the status of the female agricultural labor force is clearly of crucial interest in agricultural development, it is felt that this is an area where detailed research will be needed.

3. Daily Activities of Women on the Farm

There is a notable absence of specific information on the daily activities of either sex on the farm, whether by region, crops or ethnic group. A general agreement amongst those interviewed suggested a few definitive statements. Land-clearing, tree-felling and heavy bush clearance is exclusively a man's job throughout the country. The marketing of foodstuffs from the holding is overwhelmingly a female's job throughout the country, although wholesale trading in the North appears to be mostly in male hands.

TABLE 3

STATUS OF THE POPULATION ECONOMICALLY ACTIVE
IN AGRICULTURE
1960 PERCENTAGES

| | MALES | FEMALES |
|---|---|---|
| TOTAL ECONOMICALLY ACTIVE IN AGRICULTURE | 100% | 100% |
| EMPLOYERS, SELF-EMPLOYED (All Crops)* | 71.8 | 69.1 |
| (In Foodstuffs) | 35.1 | 49.2 |
| (In Cocoa) | 28.6 | 13.9 |
| (In Other Crops) | 2.4 | 5.4 |
| FAMILY WORKERS* | 15.0 | 29.6 |
| (In Foodstuffs) | 11.4 | 17.0 |
| (In Cocoa) | 2.7 | 11.2 |

Source: 1960 Census

* Definitions: Employers: persons who operate their own enterprise by themselves or through another person, and hire one or more person whom they pay. Self-employed: persons who operate their own enterprise. Family Workers: persons who help in running an economic enterprise operated by a member of their family and who may or not be paid.

NB Differences in figures between Section 2.3 and Table 3, due to rounding, and omission of minor categories, e.g. employment in the public and non-public sectors.

A further generalization was also made -- that the man is responsible for tending to the cash crop fields, while the woman will concentrate on fields producing food for domestic consumption. In many instances a woman may have a field of her own in which she may grow vegetables (okro, tomatoes) or pepper as her own small cash crop. It should be noted, however, that this generalization is not fully consistent with the data presented above which indicates that some women are cash crop farmers in cocoa and other crops. This too is an area of crucial importance in assessing the potential of women in development, and certainly needs to be researched in greater detail.

In the absence of such data, however, the following is offered as a generalized overview of a small-scale husband-and-wife farming unit. This picture is certainly subject to regional variation, and is more likely to be typical of Southern Regions than of the North.

Each year the husband will go to clear a new field of about 1 to 1½ acres. The woman's first involvement with this will be to organize the sale of the resulting firewood. (If the husband needs cash himself, he may however organize himself for the sale of wood, by ordering a truck to pick it up.) If she is involved, the woman will then head carry the wood to the village, and then on to market.

The newly cleared field is planted with the cash crop, usually either maize or yams which is most likely the main responsibility of the man. The field that bore last year's crop, which is still weeded, is planted with this year's food crops which will typically be the main concern of the woman. Last year's food field, which is now overgrown, is abandoned, although cassava may still grow.

All members of a village, men, women and children, excepting those in school, go to the fields during the day. In most instances the farms are at a considerable distance from the villages, i.e. 4 - 6 miles away. Thus a considerable time is spent walking to and from home and farm. Once at the fields, men may spend more time on their cash crop fields, but everyone does some planting, weeding and harvesting. At the end of the day's work, women will head carry harvested food or cash crops in season back to the village. This is exclusively women's work in most areas. Back at the village, the man's work is done.

At market day, or over several market days, the woman will head carry a portion of the crop to market for sale. The quantity sold at any given time will depend upon the quantity that has been prepared for sale (e.g. quantity threshed), immediate needs for domestic food and/or cash, and the portion of the total crop that is to be stored, either for later home consumption or later sale.

It appears that on the days that she goes to the farm, the woman will spend about 7 - 8 hours away from home, walking to and from the farm and working there. On market days, this time will be spent at market. An estimated average of 3½ hours per day is spent on household jobs. The rest of her working day, which is around 15 hours per day will be taken up with secondary jobs, preparing food for sale, or fetching water etc. In forest areas women are also involved in gathering wild foods, such as mushrooms, berries, snails etc. for domestic consumption. In the North, women and children will gather sheanuts to make a butter. This is an important secondary activity for rural women in the Northern Regions during the agricultural off-season.

1. Secondary Sources of Income

Many women are engaged in preparation, cooking and sale of such foods as keakey (a partially fermented product of maize), gari (toasted cassava), fufu (pounded from cassava, plantain or yams) and in baking. The brewing of local beer (pito) is also an activity largely in the hands of women.

Various studies have suggested that many women in agricultural areas have secondary sources of income that include sewing, cottage crafts, sale of cooked foods and sweets, etc. There is no data available giving either country-wide or regional details of such activities, but one study in Ashanti maintains that up to 3 hours a day were spent by some women in such secondary activities.

4. Women as Decision Makers in Agriculture

It is certain that women contribute significantly to small scale agricultural production in Ghana, and have a predominant role in the marketing of agricultural foodstuffs. But to what extent are they production decision makers? It may be, as some interviewees suggested, that the woman's exclusive marketing role causes her to take several crucial on-farm decisions. In this schema, since the woman alone goes to market, she alone has up-to-date marketing information.

As a result, at least in the area of foodstuffs, she knows what quantity of which crop will fetch the best price when. She will therefore decide how much of which crop is to be planted when, and also be in control of the type and timing of harvesting and storage. Once the woman has sold her produce at market, she will use the money to buy food items needed to supplement the household diet (salt, dried fish, meat, crops not grown on her family farm, etc.) as well as household items such as pots and pans, and headscarves and other clothing items.

Observers of the Northern and Upper Regions, however, say that this is certainly not an accurate picture there. Women in the North still sometimes go to market, but they sell what their husbands tell them to, and return money earned to their husbands.

In certain rural areas of the South, observers have noted that men do not know how much their produce fetched at market, and that women do not care to give accurate figures in front of their husbands. One interviewee went so far as to maintain that female dominance in small scale food crop agriculture was so strong that it acted as a deterrent to the return to the rural areas of educated young men.

On the other hand, there are opinions that stress the traditional serving role of the Ghanaian woman, and believe that although her physical contribution to agriculture is great, she does not have the mental attitude to take crucial non-farm decisions.

How many decisions are women taking in agriculture, of what type and in which areas, are essential questions that must be answered if the role of women in national development is to be adequately assessed. In this connection, the role of women in the co-operative movement should not be overlooked, and it is hoped to present details on this subject in the later paper.

5. Present Activities of the Government of Ghana related to Women in Agriculture

The Ministry of Agriculture Extension Department has a branch of its activities devoted exclusively to women. This section, the Home Science Department, is headed by a lady whose education was sponsered by USAID. The Department has experienced considerable difficulties since its inception but

by February 1975 the department will have 77 female extension officers operating in 5 regions of Ghana. The officers work with women in groups, having meetings and demonstrations, visit individual homes, and occasionally visit women's farms. An officer resides in a sub-district township, and has 3 villages to visit in her first year. She subsequently adds one new village each year. Her target for the first year is to have 30 active participants in her program. Assistance is given in three broad areas: nutrition education, food production, processing and storage, and management of resources, both in the home and on the farm. Since male extension officers, who do reach female farmers in group sessions, concentrate on all food crops, the female officers have been stressing legumes, fruits and vegetables as a vitamin and protein source for the household diet. Officers report that once the rural women receive information on these subjects, they are willing and even eager to participate in improvement projects. The program has various problems at present, most notably a lack of transport facilities for the rural workers, but anticipates a steady increase in workers, so that in five years time, the program would be operational country-wide.

## 6. Other Important Activities of Women Influencing Agriculture

No report on the role of women in Ghanaian agriculture would be complete without a mention of the market "mammy". In many terminal wholesale and retail markets in the urban centres, particularly in the South, trading is completely dominated by females, who are commonly organized into traders' associations. These associations appear to have considerable political and economic power, which ripples through all stages of the marketing system, particularly during times of scarcities.

This is clearly a highly central and important role that women play in Ghanaian agriculture, and a section of the later paper will examine market mammy trading associations in detail.