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THE UNITED STATES NATIONAL COMMITTEE FOR MAN AND THE BIOSPHERE
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WASHINGTON, D. C. 20520

An Introductory Note on Draft Environmental Profiles:

The attached draft environmental report has been prepared under a contract between the U.S. Agency for International Development (A.I.D.), Office of Science and Technology (DS/ST) and the U.S. Man and the Biosphere (MAB) Program. It is a preliminary review of information available in the United States on the status of the environment and the natural resources of the identified country and is one of a series of similar studies now underway on countries which receive U.S. bilateral assistance.

This report is the first step in a process to develop better information for the A.I.D. Mission, for host country officials, and others on the environmental situation in specific countries and begins to identify the most critical areas of concern. A more comprehensive study may be undertaken in each country by Regional Bureaus and/or A.I.D. Missions. These would involve local scientists in a more detailed examination of the actual situations as well as a better definition of issues, problems and priorities. Such "Phase II" studies would provide substance for the Agency's Country Development Strategy Statements as well as justifications for program initiatives in the areas of environment and natural resources.

Comments on the attached draft report would be welcomed by USMAB and DS/ST and should be addressed to either:

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Draft Environmental Report on Ghana

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SUMMARY

The environmental problems of Ghana center around intensive land use practices. Expanding patterns of vegetation change and environmental degradation are decreasing the carrying capacity of the land for both livestock and human populations. The effects of intensive resource utilization are exacerbated by expanding human needs and economic instability, which cause hardship to much of the population.

The major environmental problems faced by Ghana at present are:

1. Soil damage and loss resulting from overgrazing, agricultural practices and forest degradation. Continued pressure on the soil resource is increasing the rate of soil loss and is reducing fertility. Rangelands, agricultural lands and forest lands are seriously endangered.
2. Deforestation and desertification resulting from the whole system of degrading land use practices and harsh climate, including the overharvesting of trees for fuel.
3. Inadequate and hazardous water supplies resulting from climatic and geologic conditions coupled with water use practices which promote the spread of communicable disease.
4. Increasing industrial pollution resulting from resource development without environmental safeguards or planning.

Ghana is outlining a strategy to address these problems while developing available natural resources. Attempts are being made to upgrade the standard of living for the population and many development programs will have direct environmental benefits.

Sandra J. Turner
Compiler

1.0 Preface

This draft environmental report is the result of an eight-week review of information available in the United States on the natural resources and environment of Ghana. This is the first step in the process of developing an environmental profile for use by the U.S. Agency for International Development and Ghana government officials. The next step in this process should be a field study which would evaluate the information contained herein, obtain additional information, define issues, problems, and priorities, and provide direction for future efforts to deal with the management, conservation, and rehabilitation of the environment and natural resources.

The information and interpretations presented in this report are preliminary in nature and are not intended to attain the detail and accuracy needed for development planning. This study represents a cooperative effort by the entire staff of the Arid Lands Information Center, but the primary focus, research, and writing were done by Sandra Turner. The cooperation of personnel at AID, the Library of Congress, the National Park Service, and the University of Arizona is gratefully acknowledged.

2.0 Introduction

2.1 Geography

2.1.1 Boundaries and Division ^{1/}

The Republic of Ghana lies on the Gulf of Guinea on the west coast of Africa just a few degrees north of the equator. It is situated between the Republic of Togo on the east, the Ivory Coast on the west and the Republic of Upper Volta on the north and northwest. The country lies entirely in the tropics, just north of the point at which the Greenwich prime meridian intersects the equator. Land boundaries of 2285 km. and 239 km. of coastline enclose 253,538 sq. km. (92,100 sq. mi.) in a rectangle approximately the size of Oregon.

Administratively Ghana is divided into eight major regions. A ninth region, the Greater Accra Area, administers only the capital city of Accra and its immediate surroundings. The regions are further subdivided into 58 districts and 267 local administration units.

2.1.2 Geographic Regions ^{2/}

About half of Ghana is less than 150 meters above sea level. The highest elevation of 880 meters is located in a low mountain range along the eastern border. Five major geographic regions can be distinguished, as indicated on the accompanying map (Fig. 2).

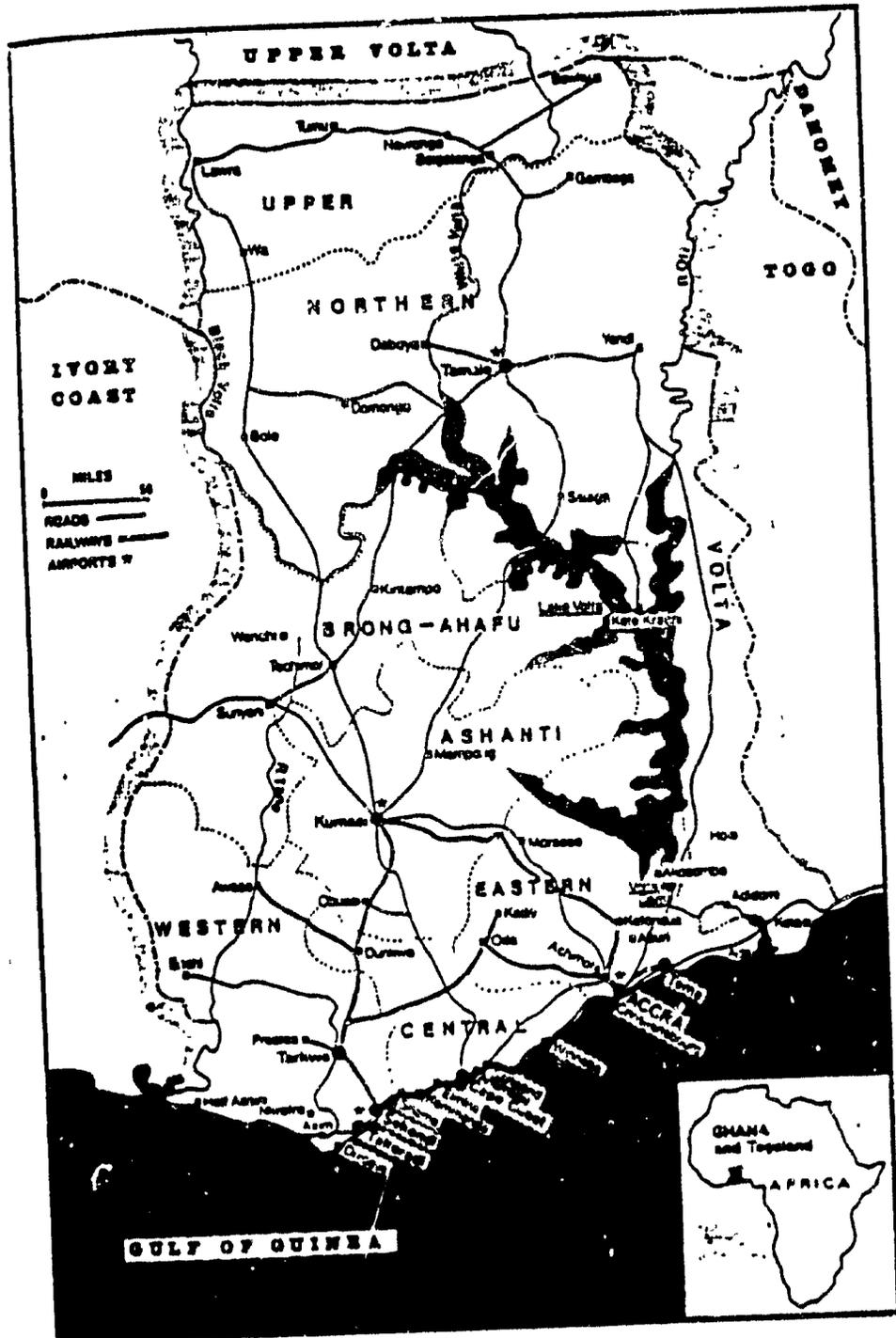
Low Plains

The low plains are subdivided into the coastal savanna, the Volta delta and the Akan lowlands. The coastal savanna forms a narrow strip along the shore of the Gulf of Guinea from Tukoradi in the west, where it is approximately five miles wide, to the border of Togo in the east, where the savanna has turned inland behind the Volta Delta and can be as wide as 80 km. The narrow band of savanna along the coast to the west is lagoon-fringed, undulating country of grass and shrubs. In this area there are a number of large commercial centers. Agriculture is practiced away from the coastline; however the infestation of tsetse fly makes the area unsafe for cattle. Toward the northeast where the savanna lies at

¹Source: Chantler, C. 1971.
Kaplan, I. et al. 1971.
U.S. Central Intelligence Agency. 1980
U.S. Department of State. 1978.

²Source: Boateng, E. A. 1966.
Church, R. J. H. 1974.
Kaplan, I. et al. 1971.

Figure 1. Map of Ghana Showing Administration Units



Source: Chantler. 1971.

the foot of the Akwapim-Togo hill ranges the terrain is mostly flat and featureless, sloping gently toward the south from an altitude of 150 meters. There are occasional isolated steep-sided hill clusters which rise to between 270 and 450 meters. Drainage from these hills empties into the Gulf through a series of shallow valleys, which are often swampy during the rainy season. This area is favorable for agriculture and because the area is generally free of tsetse fly it is suitable for cattle.

The Volta Delta is a distinct subregion of the low plains which projects into the Gulf of Guinea at the southeast corner of the country where the Volta and other smaller rivers empty into the Gulf. The land is flat and covered with scattered fan palms. Groves of coconut palms grow densely along the coast. Inland in the drier and cooler sections of the delta oil palms proliferate. The soils are easily worked and support staple crops such as cassava and corn. Some commercial shalot farming is also done. The major occupation of the delta region is fishing. The industry supplies dried and salted fish to other sections of the country.

The Akan lowlands, which cover the greatest coastal savanna area, have elevations between sea level and 500 ft. There are a number of hill ranges oriented in a northeast-southwest direction. These low plains contain the river basins of the Dansui, Pra, Ankobra, and Tano rivers. Generally the land is undulating with grasses and shrubs, although the hills may have craggy summits. These low river basins are important commercially. Food production, cocoa production, mineral industries, and forest products industries have encouraged the growth of urban centers.

Akwapim-Togo Ranges

The Akwapim-Togo ranges in the southeastern portion of the country are a rugged complex of folded strata with many prominent heights of volcanic rocks. The ranges begin in the south to the west of Accra and run northeasterly. They are cut by the Volta River which has formed a deep narrow gorge and eventually cross the international frontier into Togo. In this mountain range at the Volta River gorge is the Akosombo Dam, which impounds water to form Lake Volta. The average elevation of this section is 1500 feet and the valleys are generally deep and narrow. To the northeast the valleys are broader and the ridges are generally low. The folding in the northeast section is more complex and the heights increase greatly, with several peaks rising above 750 meters. Mount Afadajato (880 meters), Ghana's highest peak, is in this area. The ranges are covered with deciduous forests. Small-scale subsistence farms are common and coffee plantations exist.

Ashanti Uplands

The Ashanti Uplands lie just north of the Akan lowlands and extend from the Ivory Coast border to the eastern edge of the

Kvahu Plateau overlooking the Voltz basin. The uplands slope gently toward the south, decreasing in elevation from 300 to 150 meters. Erosion of crystalline rock that underlies this area has left a number of hills and ranges. These extend from the southwest to the northeast, following the pattern of geologic folding which is dominant in the country. The hills reach from 450 to 750 meters in places. As the region merges with the lowlands to the south the valleys become more open.

The Kvahu Plateau is geologically different from the surrounding uplands. It consists largely of horizontal sandstones. Elevation averages 650 meters and high points rise to 750 meters. The climate of the plateau is cooler than other portions of the uplands due to the greater elevation. The entire area receives a substantial amount of rain. Originally the region was covered by deciduous forests, but now many areas have been completely cleared for cocoa farms. Mineral deposits are extremely important in the area. Kumasi, the country's second largest city, is an important trade center and the principal roads joining the northern parts of the country to the coast converge within the city.

Volta Basin

The Volta Basin area covers 45 percent of Ghana. Located in the central and eastern portion of the country, it ranges in elevation from under 150 meters in the south and southwest to 225 meters in the north and from 300 to 450 meters at the Konkori scarp at the western edge and Garbaga scarp at the northern edge of the basin. The soils in the basin are generally poor. Long dry seasons with rainfall decreasing northward are characteristic. Population density is low and the major occupation is farming. Archeological evidence suggests that the area was more heavily populated in the past and that the region has undergone periodic burning more than a millennium. Such burning could cause erosion and loss of soil resources which would reduce the productive capacity of the land and encourage a reduction in population.

The High Plains

The high plains in the northern and northwestern part of Ghana outside the Volta Basin consist of a dissected plateau which averages between 150 and 300 meters in elevation. Rainfall is low and the natural vegetation is guinea savanna woodland. The soils of the high plains have greater fertility than those of the Volta Basin and the population is considerably higher. Grains are a major crop, though farming is generally for private consumption. Livestock raising is a major occupation due to the virtual absence of tsetse fly.

2.1.3 Climate ^{3/}

The climate of Ghana is tropical. The sun oscillates back and forth across the equator during the year and the major weather patterns which affect Ghana follow this cycle of incoming radiation by responding to changes in atmospheric circulation. Variations in the principal weather components of temperature, humidity, and rainfall are governed mainly by three major air masses that affect all of West Africa. The harmattan or north-east tradewinds are hot and dry dust-laden winds which come from the northeast across the Sahara desert. The humidity in this tropical continental air mass is low at all levels but the temperature of the mass decreases rapidly with height. The southwest tradewinds or monsoons are actually southeast tradewinds which are deflected westward as they cross the equator and thus come to Ghana from the southwest. This is the tropical maritime air mass which reaches Ghana after crossing the South Atlantic Ocean. The air mass is cool and moist. The humidity of this mass is high and the temperature decreases only slowly with height. The third air mass consists of the cool equatorial easterlies that are found at higher altitudes.

The monsoon and the harmattan approach the tropics from opposite sides of the equator, flowing towards each other. The belt at which these two air masses meet is known as the Inter-Tropical Convergence Zone (ITCZ), which is generally a region of ascending air. The ITCZ oscillates slowly and irregularly during the year, reaching farthest north in August and farthest south in January. It thus follows in phase, with a lag of one or two months, the apparent movement of the sun. The movement of these air masses back and forth across the equator is accompanied by alternating periods of drought and rain that mark the country's seasons. The number of seasons, however, is not the same throughout the country. In the north the harmattan is the dominant influence while in the south the monsoon takes precedence.

Temperature

Temperatures are high with little variation from year to year. The average maximum temperatures are highest in February or March and the greatest individual temperatures may be recorded at any time from February through April. The lowest average maximum temperatures occur in August. The difference between

³ source: Adams, D. T. 1960.
Boateng, E. A. 1966.
Church, R. J. H. 1974.
Kaplan, I. et al. 1971.
Walker, H. O. 1957.
Walter, M. W. 1959.
Walter, M. W. 1958.

the greatest and the least monthly mean values shows a gradient of variability ranging from 7°F at the southwest coast to 17°F in the extreme north. The annual mean maximum is greatest (94°F) in the north and least on the coast (85°-86°F).

Average minimum temperatures are usually lowest in January. Variability of the average monthly minimum temperatures shows the same north to southwest gradient as do the average maximum temperatures but the absolute amount of variability is less at 3°F in the southwest and 12°F in the north. The mean lows range from between 69°F to about 75°F. 51°F is the lowest temperature ever recorded in Ghana, at Kumasi and Tafo, while 109°F is the highest at Navrongo.

It should be noted that although there is actually little variation in temperature when averages are considered throughout the country, higher temperatures are generally characteristic of the north, decreasing toward the southwest. Furthermore the average diurnal range of temperature is greatest when the harmattan affects the northern portion of the country, generally in January.

Humidity

The southern part of the country is characterized by generally humid conditions throughout the year. In the coastal zone the relative humidity reaches 95 to 100 percent at night and early morning. Diurnal warming by the sun drops the humidity to 75 percent around midday but the dense vegetation prevents any further lowering of this figure except in open areas to the east, where it may drop as low as 65 percent. The moist monsoon air mass is dominant in this area.

The northern portion of the country also experiences humid conditions during the rainy season. Humidity of 95 percent may be reached during the night, dropping to 70 percent during the afternoon. In the far north during the harmattan relative humidity may be 25 percent during January at night and 20 percent or below during the height of the dry season. Humidity is particularly important because it determines the ability of air to form rain, it controls the rate at which plants and animals lose moisture, and it controls to a large extent the rate at which water bodies and the soil lose water.

Rainfall

Rainfall in Ghana is largely the result of the interaction between the harmattan and the monsoon. As the two air masses come together, the warmer harmattan is forced to rise and rain is produced as the cooler air moves underneath. These are called convectional rains. The amount of rainfall varies greatly in different parts of the country. The heaviest average annual precipitation is in the extreme southwest, and amounts gradually decrease northward. Axim, on the southwest

coast, has an average annual rainfall of over 2200 mm. Farther to the north Kumasi receives an average of more than 1450 mm. and Tamale in the far north receives 1060 mm. Thus there is a marked southwest to northwest decrease in the amount of rain received annually.

This north-south pattern is broken in the southeast area around Accra, which receives approximately 900 mm. per year. The southeast wedge of the country has a coastline which tends from south southwest to east northeast while the southwest winds travel along the coast rather than against it. Along the southeastern Ghana coast the Guinea current lies to the south and flows eastward. Cool air rising off the current and interacting with moisture-laden winds causes the southeast to have a similar amount of precipitation to that found in the north.

The principal feature of rainfall in Ghana is its seasonal character and its variability from year to year. Four principal types of rainfall patterns may be described, for which no definite lines of demarcation exist, as they are a consequence of the north-south movement of the ITCZ.

Type 1 is a single rainy season with monthly totals increasing slowly from March and reaching a peak in August or September, after which precipitation amounts decrease sharply. A single drought season lasts for approximately 5 months from October to February. This pattern occurs north of a line running approximately through Wa (10°04'N, 02°30'W) and Salaga (08°33'N, 00°31'W).

Type 2 is a single rainy season between March and October, differing from Type 1 in that there is little variation between monthly totals. The dry season lasts about 4 months. This pattern occurs south of the area described above and is bounded on the south by a line running through Kintampo (08°03'N, 01°44'W) and Hohoe (07°09', 00°29'E).

Type 3 consists of two rainy seasons with peaks occurring in May-June and October. The totals in each of these months are similar. These two rainy seasons are of approximately equal duration and amount. The periods of December to February and July to early September are much drier than the rest of the year. This pattern occurs south of Type 2 and is bounded on the south by a line through Wiawso (06°10'N, 02°29'W) and Kata (05°55'N, 00°59'E).

Type 4 consists of two rainy seasons, the principal one reaching its maximum in May and June and the secondary one in October. August is the driest month of the year. This type covers the whole of the coastal region. The western section is exemplified by Axim, which has the heaviest rainfall in the country. There the May-June maximum is particularly well marked. The amount of rain received by any area in a month or over a year is susceptible to extreme variability. On occasion, an entire

month during the rainy season may pass without appreciable rainfall. In 1963 Axim, which usually receives 220 mm. per year, received almost 3250 mm. of rain. The following year only 1700 mm. were recorded. The fluctuations may occur at any point in the country but the variability is least in areas of high rainfall and greatest in areas of low rainfall. The average duration of rain is between 2 and 3 hours. In dry months rain is likely to fall during less than 10 hours each month, whereas in the rainy season rain falls for 30 to 40 hours each month. Variations in intensity of rainfall are considerable. Rates of 200 mm. per hour have been recorded for short periods. Data indicates that the greatest intensity of rainfall is recorded for the driest portions of the country.

Wind

Wind is an ever-present component of the Ghanaian environment. Wind speeds are in general low, under 8 km. per hour inland and between 8 and 16 km. per hour at the coast. Wind velocities are least at night and during the early morning, when calms may occur, and are highest during the afternoon. During the harmattan season wind speed gradually increases northward. In January at Navrongo the average wind speed is 14 km. per hour, but is only 8 km. per hour in August. The wind direction depends upon the position of the ITCZ. Constant wind is an important factor in the environment of any area because of its drying effect on plants, animals, and soils, and particularly because of its erosive power.

2.2 Population and Economics ^{4/}

The proportion of Africans among the Ghanaian population has never fallen below 99 percent, even during the period of Colonial rule by Great Britain. Currently it is 99.8% African. Although 12 to 14 percent of the total population is of foreign origin, approximately 96 percent of these immigrants are from other African countries, particularly Togo, Upper Volta and Nigeria. The overall foreign component of Ghana's population is thought to be declining due to the enforcement of immigration laws enacted in the late 1960's.

⁴Source: Boateng, E. A. 1966.
Caldwell, J. C. 1975.
Europa Publications. 1980.
Kaplan, I. et al. 1971.
Lagum, C. 1980.
U. S. Agency for International Development. 1980.
U. S. Central Intelligence Agency. 1980.
U. S. Department of State. 1978.
World Bank. 1980.
World Bank. 1978.

The population of Ghana as of January 1980 is estimated to be 11,936,000. Ethnographically the population is divided into small groups including the Akans, Ga-Adangbe, Guan, Ewe, Gurma, Lobi, Grusi, central Togo tribes and Mole Dagbani. The Akans are the most populous group, contributing over 40 percent of the population. More than 50 languages and dialects are spoken by Ghanaians, including Akan (44 percent), Mole-Dagbani (16 percent), Ewe (13 percent), and Ga-Adangbe (8 percent). English is the official language of the country but there is no available record of the proportion of English-speakers in the population. The literacy rate is 30 percent.

Primary and middle school education is mandatory where there are enough facilities and tuition is free. After a rise in primary and middle school enrolment between 1960 and 1970, current estimates by the World Bank show a decline.

Religious affiliation is rather evenly divided in Ghana between those of traditional animist belief (45 percent) and those of Christian belief (43 percent). Twelve percent of the population is Muslim.

The most outstanding characteristic of Ghana's population is its extreme youth. In 1960 46.9 percent of the population was under 15 years of age. Most recent figures indicate that 47.5 percent of the population is under 15. Thus a continuing high fertility rate coupled with a decreasing infant mortality rate is resulting in an ever more youthful population. At the other end of the spectrum the life expectancy has increased from 40 years in 1968 to 48 years currently. The overall growth rate is reported to be between 2.9 percent and 3.3 percent by various sources. This figure is below the 1970 estimate that was expected for 1980 of 3.5 percent.

Ghanaian population density increased from 29.0 person per sq. km. in 1960 to 36 per sq. km. in 1970 and currently 44 per sq. km. However, these figures do not indicate the actual population densities found in Ghana because the population is unevenly distributed due to historical, economic and cultural factors. Approximately 80 percent of the total population is found in the south and the far northeast and northwest. Between the higher density regions a broad zone exists in which the population is quite sparse. The greatest general concentration occurs in the south around the urban centers of Accra and Kumasi where densities are over 76 persons per sq. km. This heavy concentration of population is due largely to the presence of mineral deposits, cocoa producing regions, and the coastal ports.

In contrast a large part of the Volta Basin had population densities at the time of the 1960 census of less than 9.6 persons per sq. km. This is an area of low soil fertility and great seasonal variation in water supplies. Concentrations of population in the extreme northeast and northwest are apparently due in part to more fertile soils and the general absence of tsetse fly.

Migration is an important component of Ghana's population structure and economy. Immigration has greatly influenced the pattern of population distribution between the various regions of the country. The immigrants are generally from Togo, Upper Volta and Nigeria. They come to Ghana to find work and generally remain only a few years before returning to their native countries. The foreign population is highly mobile, moving from rural areas to towns as new opportunities become available. Most immigrants are employed in agriculture and mining. Generally the immigrants are males in the economically active age group though quite a few women and a few children also immigrate.

Internal migration in Ghana has become an integral part of the social structure. The development of mining and the establishment of cocoa farming, beginning around the turn of the century and reaching a peak increase during the period of 1948 to 1954, created conditions of social change and gave rise to increased mobility of the population. The majority of migrants consist of young adults. Migration has made a deep impact on the social and demographic structure of the country. Both urban and rural areas are affected.

Seasonal migration north to south persists because the combined income from north and south exceeds income from full-time employment in the north or south. Regional variations in farming calendars provide the basis for seasonal labor migration. The slack season in the savanna zones corresponds to the busy season along the southern coast. Short term movement from savanna to forest is thus a reasonable adaptation, particularly because the type of work required in the cocoa and coffee regions, namely harvest labor and the clearing of new plantations, lends itself to seasonal performance. Inelasticities in labor supply would unquestionably restrain the expansion of these export commodities.

Expansion of cocoa acreage was the principal factor underlying the growth of seasonal migration between 1945 and 1954. An increase in farm acreage was stimulated by rising cocoa prices. Approximately 70 percent of the labor employed on cocoa farms is hired on a casual and piecework basis.

The staple crops of millet, guinea corn, and yams are the principle crops of the north. These crops are seasonal and hence production has expanded with the availability of seasonal labor. Not only have the earnings and savings of migrants provided the capital required to increase yam output, but migrant earnings used to buy food in densely populated areas has increased the demand for yams. It is estimated that perhaps 30 to 40 percent of migrant earnings return north with the migrant, which provides an important source of capital for northern areas.

Permanent migration from north to south is most likely to occur in the highly industrialized areas. The mineral industries attract a constant flow of people, as do large urban centers. Rural to urban migration is increasing as benefits of living in a developing city economy increase. Urban center populations are increasing at the

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rate of 5.5 percent, which greatly exceeds the national rate of 3.0 percent. This may raise the proportion of urban population from 28.9 percent in 1970 to an estimated 41.0 percent in 1985. The share of agricultural population is expected to decline from 58.4 percent to 51.1 percent over that same period. A rapid increase in urban population may not only result in an increase in urban poor as employment and services become increasingly unavailable but may also become a drain on rural areas which supply food to market.

Ghana has a diverse resource base and a per capita GNP at \$370 (1977). Sixty-one percent of the population is engaged in agriculture and this activity provides 40.8 percent of the GDP. Cocoa, timber and coffee are the most important agricultural commodities. Industrial production, including mining, produces another 20 percent GDP and trade and finance produce over 22 percent.

Ghana is currently undergoing a period of economic stagnation brought about in part by a declining currency exchange rate and rapid inflation rates of 36 percent for the last 5 years and 145 percent in 1976/77. As a result the real GNP per capita has declined precipitously. The real per capita growth rate has declined 2.4 percent. At the same time tax performance has declined and unrecorded or underrecorded trade has increased. Foreign imports have been restricted. Rural transport systems have deteriorated from lack of input. Agriculture, mining, and manufacturing have all had negative average annual growth rates between 1970 and 1977.

These trends are beginning to be slowed or reversed. The rate of inflation has been cut to 80 percent in 1978/79 and is continuing to decline. Import restrictions have resulted in a relatively small foreign debt. Ghana is working on a plan with the International Monetary Fund to help stabilize its economy.

Approximately one half of Ghana's population lives at or near the subsistence level. One third of the population has access to potable water. An estimated 50 percent of the population suffers from parasitic and water-borne diseases.

Rural-urban dichotomy in the availability of services is evident. Life expectancy throughout the country is 48 years but that breaks down to 56 years in urban areas and 42 years in rural communities. Rural areas have only 29 percent of the nation's health facilities and infant mortality may be 3 times as high in rural areas. Only 6.5 percent of the rural population had pipe-borne water in 1975 compared to 91 percent of the urban population. Literacy rate in rural areas is 22.1 percent compared to 50.1 percent for urban areas. It is difficult to determine the actual distribution of cash between the urban and rural sectors, particularly because the rural sector is relatively demonetized. However, it is obvious that even in times of economic stability commodities and services are less available to the rural population while their contribution to the GDP is greater than that of the urban population.

3.0 Natural Resources

3.1 Soils ^{5/}

3.1.1 Introduction

Soils are the product of parent rock material, climate, vegetation, topographic relief, drainage, and time. Parent rock material is fairly uniform throughout Ghana, so the breakdown product of that rock is similar. All formations are geologically quite old, therefore the processes which occur over long periods of time have had equal effects on soil development. Relief and drainage are also similar throughout Ghana but soil differences related to these features are more evident in the wetter areas of the country. Climate determines the processes to which soil is exposed and the factors that are mainly responsible for breaking up rock. Vegetation provides the organic substances which give the soil the characteristics that distinguish it from rock waste or sand. Other biotic factors such as soil microorganisms play an important part in soil development once some vegetative matter is present.

Due to the tropical environment, the soils occurring in Ghana are highly weathered, sesquioxide-rich, humus-poor and mainly kaolinitic. Such soils are distinctly related to two major ecological zones, the humid forest and dry savannah. In the literature they have been variously classified as Lateritic Soils (Kellogg 1949); Sols Ferrugineux Tropicaux Lessives (Aubert 1965); Forest and Savannah Ochrosols and Forest Oxisols (Brammer, 1962); Oxisols (Ghana Soil Survey Staff, 1960, 1967); and Luvisols, Ferralsols and Acrisols (FAO 1968, 1970). Derived from rock types which characteristically yield soils of low productivity, they tend to gain fertility with increased vegetation cover as a source of increased organic matter. If this were the only process involved, soil fertility would increase from north to southwest as vegetation cover increases. However, natural patterns of weathering and leaching and the activities of man continually change the structural and fertility of the soil.

⁵ Source: Boateng, E. H. 1966.
Interafrican Committee for Hydraulic Studies. 1979.
Johnson and Johnson. 1977.
Kaplan, I. et al. 1971.
Obeng, H. B. 1973.
Obeng, H. B. 1972.
Papadakis, J. 1966.
Smith, G. K. 1962.

The soils of Ghana tend to be a thin stratum overlying decomposed and infertile rock. This scanty resource has been subjected to land use practices which have stripped the soil of fertility. Erosion rates are high and infiltration of water is low throughout most of the country. Slash and burn agricultural methods tend to increase the propensity to erode. Drought, overgrazing and expanding cultivated areas combine to reduce the native vegetation cover, thereby decreasing nutrient replacement in the soil and increasing the tendency to erosion.

Soil should be considered the most valuable natural resource in Ghana if only because agriculture remains the most important economic sector. Further, the soil resource affects the recharge of groundwater systems and the quality of the surface waters. Degradation of soils can change the dominance patterns in vegetative systems and these in turn will affect the faunal components of the environment. Soils in this complex environment constitute an extremely fragile component of the ecosystem.

Attitudes towards the soil resource seemed, in the past at least, to tend towards utilization without concern for conservation. At least two publications in the late 1960's suggested a reduction in the number of fallow years between cultivation cycles without commenting on the reduction in soil fertility which would follow. An increase in mechanical agriculture is another developmental strategy which can certainly endanger the soil structure, organic matter and overall fertility of these very shallow soils. Currently efforts are being made to combat erosion and soil conservation legislation was established as early as 1957. The Soil Research Institute of the Center for Scientific and Industrial Research (CSIR) has conducted regional soil surveys and experimented with soil utilization.

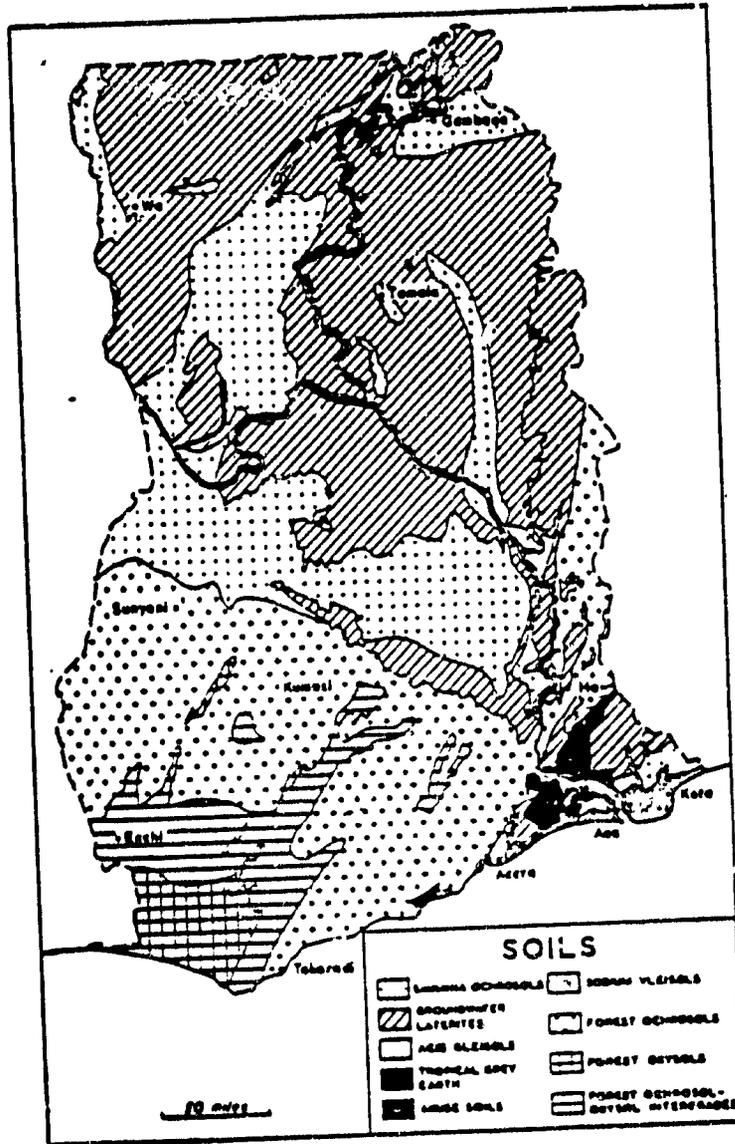
3.1.2 Soil Zones

Since climate and vegetation are mainly responsible for determining differences in soils found in Ghana, a broad classification of soils can be made. The categories are soils of the forest zone, soils of the coastal savannas, and soils of the interior savannas. Within each of these main categories there are a number of sub-types due to significant differences in geology and topography.

The Forest Zone

The forest zone is underlain by quartzite rocks comprised of granites and gneisses over large areas. The surface soil has a light texture and a grey-brown color, and is rich in humus and worm-casts. Below this topsoil is a reddish brown zone, a meter thick, containing ironstone concretions. These are formed by iron-containing solutions during dry periods.

Figure 3. Soils of Ghana



Source: Boateng, E. A. 1966.

Quartz gravel is found mixed with the concretions. Down to a depth of 3 meters there is a lower zone of clayey rotten rock, pale gray-yellow to gray and mottled reddish or orange towards the top. This zone rests on weathered rock.

The forest soils of Ghana are of two principle types, ochrosols and oxysols. The ochrosols have colors ranging from red-brown on higher slopes to orange-brown or yellow on lower slopes. These soils are generally well drained and cover the largest portion of the forest, and are less acidic than the oxysols. Oxysols cover a relatively small area, are highly leached, and tend to be more acidic. They range from orange-brown on lower slopes to yellow-brown on upper slopes. Ochrosols are found in areas with rainfall between 1150 and 1650 mm. per year whereas oxysols are found in areas of 1750 to 2150 mm. Under natural conditions forest soils contain adequate nutrients in the organic horizon (top soil). When forest is cleared for cultivation the nutrient level is drastically reduced.

The Coastal Savanna Zone

The chief differences between the soils of this zone and the forest zone soils are the result of lower rainfall and greater exposure of the soil to evaporation due to a comparatively thin vegetation cover. These soils are younger because of stripping of the soil mantle during Quaternary fluctuations in sea level. Consequently, weathering rock usually occurs at only moderate depths in the soil profile. The geology of the area is somewhat varied, yielding several types of soils. The principle soils are savanna ochrosols, the groundwater laterites and tropical blackearths (Akuse soils). Other soils are tropical gray earths, acid gleisols and sodium vleisols.

The savanna ochrosols were formed on the Tertiary deposits bordering the Volta delta. They are well-drained, friable, porous loams ranging in color from red to yellow-brown. These are the most fertile and easily cultivated soils in the coastal zone. The groundwater laterites were formed on acidic gneisses. They are pale-colored sands of varying thickness laid over mottled, gravelly clay. This soil has poor drainage during the wet season. Tropical black earths were formed on basic gneisses which extend as a broad band northeastwards across the plains from Tema and cover some 1690 sq. km. They are heavy dark-colored clays with a poorly developed profile and are saturated during the wet season but develop wide cracks during the dry season. These soils are alkaline and may be used for mechanical and irrigated agriculture under careful management. The other three soil types are more limited in distribution and have little use in cultivation. The tropical gray earths do provide browse for cattle.

The Interior Savanna Zone

The interior savanna is underlain largely by Voltaian rocks but there are wide expanses of granite associated with an older crystalline complex. Due to the intense dry season the soil is exposed to alternate leaching and evaporation. Leaching removes nutrients while evaporation promotes ironstone hardpan formation near the surface. Soils of this zone are poor in organic matter and nutrients and they are often impervious to rainfall infiltration. Two groups of soils are found in this zone, savanna ochrosols and groundwater laterites. Acid gleisols have limited distribution bordering the Black and White Voltas and their larger tributaries.

The savanna ochrosols are found on the Voltaian sandstones and the Tarkwaian and Lower Burimian rocks. They are well-drained, friable, porous loams, red or red-brown in color. Soils may be quite deep in depressions but only one-third to one meter deep on the upland area, with ironstone concretions below. These soils are deficient in nutrients, particularly phosphorous and nitrogen. Nonetheless they are extensively formed.

Groundwater laterites are very extensive over Voltaian shales and granites. They are pale colored sandy or silty loams of very shallow depth, up to 2/3 meter, and are underlain by ironpan or a mottled clay layer. Drainage is poor from these soils, which tend to waterlog during the dry season. They are highly susceptible to sheet erosion and their only use is as a rather poor pasture which is easily degraded.

3.1.3 Classification

The Interafrican Committee for Hydraulic Studies has developed a classification for the soils of the savanna region of west and central Africa. This system classifies soils according to their productive capacity. Seventy-one percent of Ghana lies within the range of that study, including all of the interior and coastal savanna soils. There are 5 classes of soils, defined below. It should be noted the definitions refer to the capability of the soil at present under traditional methods of cultivation, i.e. without major improvements, using traditional hand cultivation methods and with little or no use of imported fertilizer. The capability definitions refer to yields which range from poor (for class 4 soils) to good, but in the west African context the yields produced by traditional methods are generally somewhat low compared with yields that are obtained on agricultural stations using improved methods.

Class 1: Generally good soils. These soils do not have any serious limitations, and are able to produce good yields of suitable, climatically-adapted crops.

- Class 2: Generally moderate to good soils which have slight to moderate limitations which may restrict their use. Yields of climatically-adapted crops are moderately good.
- Class 3: Generally poor to moderate soils. These soils have limitations of moderate intensity, are usually of fairly low natural fertility, and generally give low to moderate yields of climatically-adapted crops under traditional systems of management.
- Class 4: Generally poor soils. These soils have moderately severe to severe limitations and, under traditional systems of management, give generally poor yields.
- Class 5: Soils generally unsuited to cultivation, though sometimes locally suitable for rough grazing or other extensive uses. They suffer from limitations which are generally severe enough to exclude cultivation, such as shallow depth, steep slope or very unfavorable soil reaction (extreme acidity or salinity/alkalinity), virtually preventing crop growth unless improved.

Class 1 soils are restricted to a small area in northwest Ghana along the Black Volta and comprise at most one percent of the total area of the country. Class 1 also occurs in a mosaic where Class 5 soils are dominant in north central Ghana on the Volta Delta, and in mosaics with Class 3 and 4 soils along Oti River. Class 2 soils are not represented in Ghana, except in a mosaic where Class 4 predominates. Class 3 soils are quite prominent throughout the savanna region, covering a large section of area in the west, northwest and northeast. Perhaps 30 percent of the entire country is within this classification. The majority of the rest of the savanna is a mosaic of Class 3 and Class 4 soils with some areas of unbroken Class 4 soil in central Ghana. Class 5 soils only occur in south-eastern Ghana near Accra and near the Volta River. Other occurrences are in mosaics as noted previously.

No similar classification is available to illustrate the utility of forest zone soils. These soils are being used intensively for the cultivation of cash crops, particularly cocoa and oil palm.

3.1.4 Soil Use

Much of Ghana is devoted to agriculture, pastoralism, or a combination of the two activities. Sixty-one percent of the

population earns its livelihood from these activities. Large areas are temporarily exploited at a low technical level and then soil fertility is restored by a system of fallows in the traditional pattern of staple agriculture. The clearing of land is accomplished by burning. The fallow system leaves the soil without vegetative protection during the rainy season when the intensity of rain tends to erode and leach the soils. Overgrazing is evident throughout the area of cattle production, which exposes the soil to degradation. Surface mining of bauxite and diamonds constitutes an important land use in localized areas.

3.2 Water Resources ^{6/}

3.2.1 Introduction

In most of Ghana, including all of the northern and eastern administrative districts and some coastal areas, seasonal shortages of water, especially of potable water, are chronic. The seasonal precipitation is irregular in occurrence and quantity. Many streams and springs fail in the dry season and many wells go dry. At all seasons the availability of safe water supply is inadequate. Water borne diseases are prevalent. Pollution of water by industry, commercial, domestic and community wastes is common. Improvement, utilization and conservation of the available water resources are problems which need careful consideration if they are to meet the needs of the future.

Data and general information on the water situation is unequally available for the water regions of Ghana. The Volta River Basin is well described because it includes the entire savanna zone which comprises approximately 70 percent of the country. The savanna zone was hit by the Sahel drought of 1970-1974. The forested region of the country has considerably greater water resources and water development potential but the literature coverage of this region is less complete and problem areas are less clearly defined, though certainly not less important.

⁶Source: Boateng, E. A. 1966.
Europa Publications. 1980.
Ganley, J. P. 1976.
Gill, H. E. 1969.
Hill, P. 1970.
Interafrican Committee for Hydraulic Studies. 1979.
Kodjo, M. N. 1978.
Mensah, G. G. 1976.
Ghana (Government). 1966.
U.S. AID. 1979.
U.S. Central Intelligence Agency. 1980.

Water legislation is concerned with some aspects of water pollution and water conservation, and also with the Volta River as a developing resource (see Appendix IV). Administrative responsibility for water policies is distributed throughout a number of ministries and departments. In general Ghana is aiming toward the fullest possible development of water resources while trying to minimize and correct any resulting environmental problems.

3.2.2 Precipitation

Precipitation has been considered in the introduction to this report (see Section 2.1.3). Rainfall is erratic in Ghana and leads to erosion and leaching of the soil as well as to high runoff percentages. High temperatures and constant winds cause high evaporation. For these reasons the water available from precipitation will not be treated separately from surface water.

3.2.3 Surface Water

Ghana is drained by a large number of streams and rivers forming a network over most of the country. In addition there are a number of coastal lagoons, the vast man-made Lake Volta and one natural lake, Basumtwi, which has no outlet to the sea. Not all streams flow throughout the year. Even in the wettest areas all the smaller streams shrink considerably or dry completely at the height of the dry season. Although rainfall makes a direct contribution to streams during the rainy season, most perennial bodies of water are fed by springs.

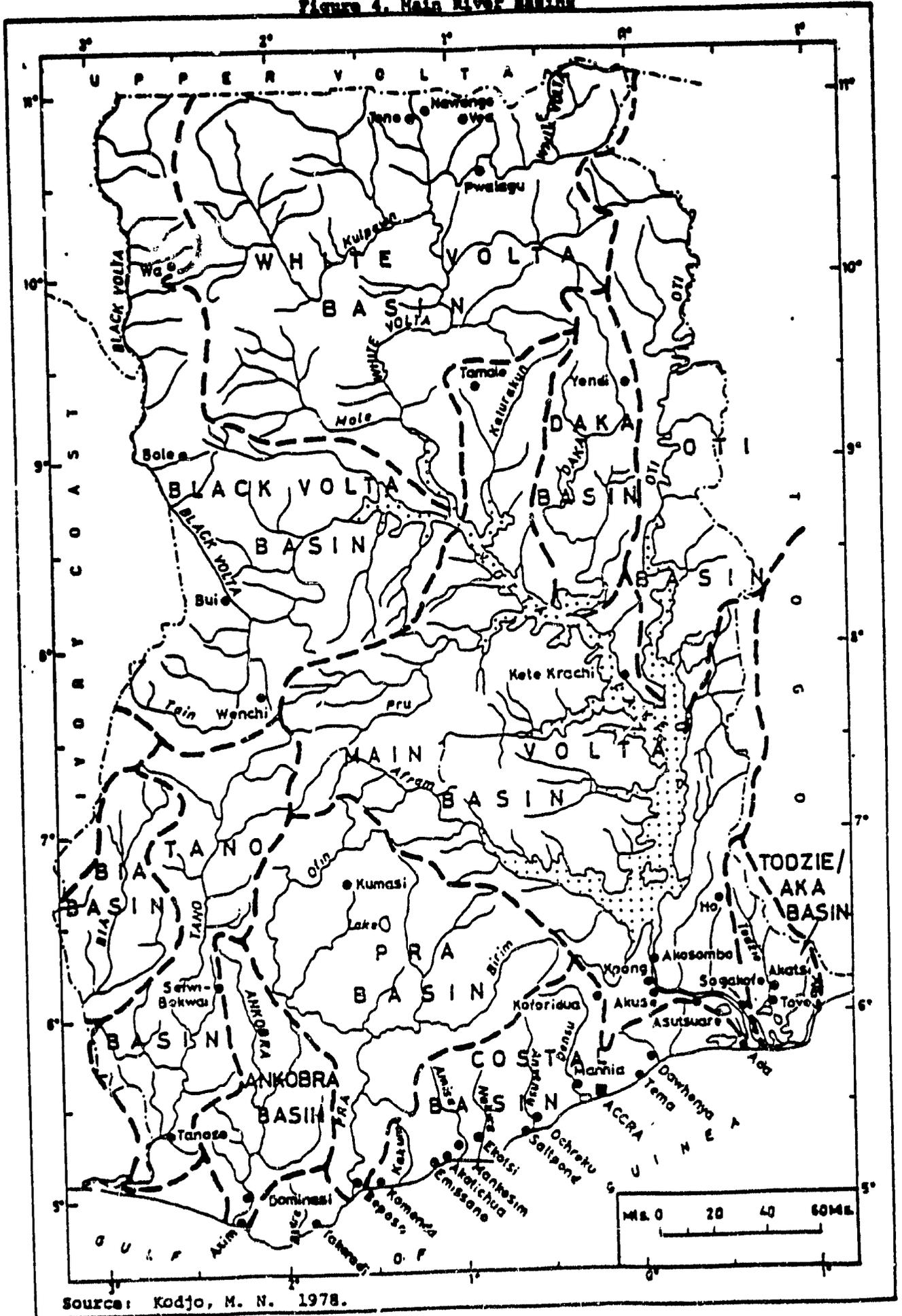
The drainage of Ghana is dominated by the Volta system, which covers the north and eastern sections of the country. The Kwahu Plateau divides this system from the southwestern river basins of the forest zone. The largest of these river basins are the Pra, Ankobra and the Tano, but some of the smaller ones are of considerable local significance.

3.2.3.1 The River Basins

Volta River Basin

The most striking feature of savanna river basins is the variability of flow within the rivers and their tributaries within a given year and from one year to another. The Volta river basin comprises 398,860 sq. km. Eighty-five percent of the basin is shared by Upper Volta and Ghana and the remainder extends into Ivory Coast, Benin, Togo, and Mali. The headwaters of the basin are in Upper Volta while the mouth empties into the Gulf of Guinea in Ghana. The basin consists of several independent sub-basins: the Black Volta, the White Volta and its tributary the Red Volta, and the Volta River itself.

Figure 4. Main River Basins



Source: Kodjo, M. N. 1978.

Table 1. Size of Main River Basins

<i>Name of River Basin</i>										<i>Catchment Area Square Miles</i>
										63,982
1.	Volta	..	..	..	..	..	..	..	..	2,500
2.	Bia	..	..	..	..	..	..	..	..	5,742
3.	Tano	..	..	..	..	..	..	..	..	3,267
4.	Ankobra	..	..	..	..	..	..	..	..	8,953
5.	Pra	..	..	..	..	..	..	..	..	528
6.	Ochi-Amissa	..	..	..	..	..	..	..	..	580
7.	Ochi-Nakwa	..	..	..	..	..	..	..	..	660
8.	Ayensu	..	..	..	..	..	..	..	..	985
9.	Densu	..	..	..	..	..	..	..	..	325
10.	Subri-Amansuri	..	..	..	..	..	..	..	..	130
11.	Butre	..	..	..	..	..	..	..	..	380
12.	Kakum-Saruwi	..	..	..	..	..	..	..	..	720
13.	Todzie	..	..	..	..	..	..	..	..	665
14.	Aka and Around Keta Lagoon	..	..	..	..	..	..	..	..	2,376
15.	Minor Coastal Streams	..	..	..	..	..	..	..	..	91,843

Source: Republic of Ghana. 1966.

- Black Volta

The Black Volta rises in Upper Volta and flows to Lake Volta in Ghana. A key gauging station of the Black Volta is located at Bui, about 130 km. from Lake Volta. The average annual flow of the Black Volta is 7.78 billion cubic meters, of which about 3.6 billion cubic meters is international water coming from Upper Volta. This is equivalent to only 6 percent of the total volume of precipitation occurring in the Black Volta basin, as much potential runoff is lost to evaporation. September is the month of peak flow while March is the month of lowest flow. The Black Volta has a year-round flow but with a high-low variance of approximately 900 percent.

- White Volta

The White Volta rises in a very arid part of the Sahelian region in Upper Volta and flows only after periods of heavy rainfall. The river bed slopes gently, promoting the formation of shallow pools which are filled during flood season but empty during the dry season. Two important tributaries, the Sissili and the Red Volta, join the White Volta in Ghana. The combined annual flow measured at Nawuni is 7.8 billion cubic meters. The total discharge of the White Volta represents only 10 percent of the rainfall that falls within the Volta River Basin.

- Volta

Prior to the construction of the Akosombo Dam in 1964 the Volta River originated at the confluence of the Black Volta and White Volta. Since 1964, this confluence and most of the Volta River have been inundated by the reservoir behind the dam. Below the dam the river continues 99 km. to the Sea. The mouth is approximately a mile wide with shifting sandbars.

- Lake Volta

Lake Volta is 400 km. long and covers an area of 6,730 sq. km. at an average depth of 17 meters. The Volta tributaries as noted and a number of smaller tributaries flow into it. The total capacity has been estimated at 148 billion cubic meters. Major arms of the lake extend into the valleys of the principal tributaries and give a total shoreline of approximately 7200 km. About one fourth

of the entire flow from the Volta River Basin is retained in Lake Volta. The remainder is discharged into the Gulf of Guinea, less minor diversions for irrigation and evaporation and seepage losses.

Pra River Basin

The Pra River and its main tributaries the Ofin and the Birim form the largest river system draining the forest zone in Ghana. The Pra rises in the Tutuojiran Range in the Kwahu Plateau and flows south to discharge into the Gulf of Guinea at Shama. About 95 percent of the basin is covered by moist semi-deciduous forest. The lower section is a transition to evergreen rain-forest and the coastal strip is covered by thicket and grass. Runoff is measured at 16 percent of the annual rainfall onto the basin.

Ankobra River Basin

The Ankobra is much smaller than the Pra and lies to the west of it within the forest zone. The chief tributaries of the Ankobra are the Mansi and the Bonsa. The headwaters of both lie close to the Pra system. The Ankobra contains rapids in its upper reaches but the lower tidal segment is navigable for approximately 80 km.

The Tano River Basin

The Tano is a long north-south system which partially forms the international border with the Ivory Coast. The river rises not far from Techiman, northwest of Kumasi, and flows almost directly southward to the sea. It is navigable for small launches as far as Tanosu.

Minor Coastal Watersheds

A number of small river basins transect southern Ghana. These basins are usually small and the rivers empty into the sea after flowing several kilometers. Some of these basins are the sources of water for urban and industrial centers.

Lake Bosomtvi

This natural lake lies east of Kumasi and has the form of a caldera. It covers 48 sq. km. and is between 713 and 744 meters deep. The lake sides rise 1550 to 4340 meters above the surface. Several small streams flow into the lake but there is no outlet. The lake is considered sacred by the Ashanti.

Coastal Lagoons

Between Accra and Cape Three Points to the east there are several lagoons. Most of these are formed by the mouths of rivers which have been ponded back by the sea and separated from it by a low sand bar. These become tidal flow areas at high tide so that the water is brackish. This area might possibly constitute a considerable estuary resource.

3.2.3.2 Water Quality and Quantity

Despite the irregularity of some components of the surface water resource, Ghana has a significant amount of water which could be developed. The quality of this water, however, is considered to be quite low. Pollutants of all types enter streams and have considerable impact on the biotic and abiotic environment. These problems are discussed in Section 4 of this report.

3.2.3.3 Use of Surface Water

The volume of surface water actually being used in Ghana has not been determined. However, Ghana is apparently utilizing a greater percentage of the surface water than are her West African neighbors. Data indicates that in West Africa as a whole only 3 percent of the annually available surface water is being used.

Storage

Ghana has 3 dams completed or under construction. Two, the Akosombo and the Kpong on the Volta River, provide electricity. There is no information available on the Weijsa Dam in the coastal region west of Accra. On the Black Volta a fourth dam is under construction at Bui. This dam will also provide electricity. A fifth dam along the international border with Upper Volta on the Black Volta at Nounbiel will produce electric energy and provide water for irrigation. This dam is being developed jointly by Ghana and Upper Volta. Descriptions of these dams are given in Appendix VII. The reservoir capacity at Akosombo is normally about 16,000 million cubic meters but may be as much as 100,000 million cubic meters in a year of heavy rainfall preceded by several years of drought.

Fishing

The total inland fish catch for 1976 was 41,900 metric tons. This figure does not include subsistence fishing. Fish are a valuable source of animal protein. Statistics on the catch size for river fish are less well documented than for lake fishing. Indications are that a great proportion of the catch from rivers comes from smaller streams. It is estimated that the Lake Volta catch is 20,000 tons per year.

Irrigation

For the past 10 years the Government of Ghana has had a policy which encourages the development of irrigation projects throughout the country. Most of these projects are in the northern regions of the country and involve small- or medium-sized dams and pumping schemes along some of the perennial streams. Irrigation is considered to be the only way the country can become self-sufficient in its cereal and fiber requirements.

Of the 27 existing or planned irrigation projects in the country in 1977, 22 schemes are located in the savanna region. In 1976 the total land area under irrigation was only 2,495 hectares in the savanna area but the total irrigable area was 11,340 hectares. Short- and long-term development plans will bring the total irrigable area to 435,000 hectares. The accompanying tables give a breakdown by project and region. It is estimated that by the year 2030 the irrigated area in Ghana's northern regions alone could reach 800,000 hectares. Irrigation development to satisfy the needs of human, livestock and industrial development should consider the entire Volta River Basin and the countries involved.

Small local water retention projects to meet the end of growing season water requirements of crops started during the rainy season and for flood recession farming along the perimeters of reservoirs are possible in the area. It is probable that these techniques are being utilized but there is no data available concerning the amount of land farmed with these techniques.

Table 2. Existing Irrigation Projects in the Ghana Savanna Region

<u>Name of Project</u>	<u>Region of Ghana</u>	<u>Area Irrigated in 1976 (ha)</u>	<u>Total Irrigable Area (ha)</u>
Tono	Upper	-	2,540
Vea	Upper	500	1,400
Akumadan	Brong Ahafo	275	1,400
Afram	Eastern	-	200
Asutsuare	Eastern	1,360	4,000
Afife	Volta	100	1,000
Adidome	Volta	-	200
Dawhenya	Gr. Accra	100	400
Ashiaman	Gr. Accra	160	200
Total		2,495	11,340

Source: CIEH. 1979.

Table 3. Irrigation Projects in the Ghana Savanna Region Estimated to be Completed Before 1981

Name of Project	Region of Ghana	Potentially Irrigable Area (ha)
Tamne	Upper	1,440
Bontanga	Northern	500
Passam	Northern	1,200
Lamassa	Northern	400
Kpong Akuse	Eastern	6,600
Areyime	Volta	400
Kpandu Torkor	Volta	400
Total		10,940

Source: CIEH. 1979.

Table 4. Long Term Irrigation Projects in the Ghana Savanna Region

Name of Project	Region of Ghana	Potentially Irrigable Area (ha)
Pwalugu	Upper/Northern	138,000
Lake Shore (1)	Northern/Volta	39,000
Bul	Northern/Brong Ahafo	32,000
Avu Keta	Volta	30,000
Accra Plains (2)	Eastern	165,000
Angaw	Gr. Accra	10,000
Total		414,000

Source: CIEH. 1979.

Industrial

The use of water is important to the development of some industries in Ghana. There is no indication in the literature that there have been constraints on the manner in which water is utilized for industrial purposes. In many cases the industrial use of water has created severe environmental problems. Mineral industries, breweries, tanneries, and textile, rubber and food industries all utilize water in processing and all major water systems are affected. Pollution of water resources will be discussed further in Section 4.

Navigation

Inland waterways, particularly large rivers, have long been used for local transport of passengers and cargo. Long distance transport is hampered by rapids in most rivers. The lower sections of the Volta, Ankobra, and Tano rivers are navigable by shallow-draft motor launches.

Lake Volta is large enough to provide opportunities for the growth of a water transport system. There is an embryo Marine Division of the Volta River Authority. A number of small craft, launches, barges, and tugboats comprise the commercial fleet on the lake. There is at least one ferry hauling automobiles and passengers.

3.2.3.4 Surface Water and Health

Surface waters are often polluted in Ghana and the activities of man have caused not only the spread of pollution but the spread of water borne disease vectors. Dams and water conservation practices spread onchocerciasis, schistosomiasis, and mosquito-borne diseases. Waste disposal has led to a high incidence of enteric fever and diarrhoea. It is recommended that all unprotected or surface water be treated to insure safety before use.

The upper reaches of the Volta River basin have perhaps the highest infection rate of onchocerciasis in the world. This is a microfilarial disease transmitted by a small black fly Simulium damnosum. In 1970 a seven nation control project was proposed to combat this disease. Massive spraying with insecticides was begun in 1975 in an attempt to kill the simulium larvae. The project, which covers even small streams during the rainy season, is expected to last 20 years. Spraying of the onchocercal worm breeding sites may continue for as long as 40 years. For the present this seems to be an effective control method for known habitat.

Schistosomiasis has become a health problem in Ghana because of the development of the water system. The snail host of this disease thrives in quiet water.

Trematode transmission is increased by wading in infected irrigation and lake water.

Increased mosquito breeding sites are created by water impoundments. Increased population mobility has likewise aided in the increase of malaria. Sleeping sickness has increased in lake areas.

Tsetse fly infestation is common in southern Ghana and the protozoan infection it carries (trypanosomiasis) has long been an obstacle to domestic livestock development of that area. Control attempts have involved spraying larvicides along bodies of water. The flies have adapted and changed or extended their range. The fly constitutes a natural habitat protection mechanism because wildlife animals are generally resistant to the disease.

3.2.4 Groundwater

In any groundwater system topography and climate are the primary factors which affect infiltration for recharge of the groundwater resource. Subsurface geology determines the location, boundaries, storage, transmittal and quality of the water resource.

The Basement Complex known as the Libro-Ivorian-Voltaic Shield is comprised of metamorphosed Precambrian granites, schists, quartzite and various eruptive rocks. The lithologic nature of these basement rocks, which are the most prominent component of Ghana's geologic setting, is not conducive to good groundwater prospects. This basement rock is highly susceptible to fracturing and weathering, however, which does increase the groundwater potential.

Sedimentary basins make up only a small portion of Ghana's geologic structure. Of these the Paleozoic sedimentary cover found in the central Volta Basin is not favorable for groundwater except where fracturing has occurred. The Quaternary and continental terminal deposits which cover Mesozoic and Cenozoic sequences of basin sediments offer good groundwater prospects. These occur at two very restricted areas along the coastline. One is found along the eastern border with Togo and the other is found along the western border with Ivory Coast.

Less than one percent of Ghana is underlain by good to fair aquifers. This figure refers to the native rock type and structure. Fracturing and weathering processes which are extensive influences throughout the country, tend to increase the storage and yield capacities of the basement rock.

3.2.4.1 Groundwater Occurrences

The basement complex comprises the Precambrian geohydrologic province, which may be further divided into upper, middle, and lower Precambrian subprovinces. These provinces cover approximately 45 percent of Ghana. This area includes most of Ghana from north to south, excluding a large area in the central Volta River basin.

Groundwater occurrences in basement formations tend to be extremely variable and discontinuous. This is caused by the highly localized nature of the fracturing and weathering processes. Fracturing and weathering generally occur together since fracturing promotes weathering. Thus a surface area of extreme weathered condition is likely to overlie a fractured area and favor groundwater bodies. Well yields off these basement rocks are usually low, averaging from 0.5 to 8 cubic meters per hour. Well depths average 15-40 meters. The basement complex is considered to be a poor but usable aquifer, particularly for rural water supply.

The Paleozoic sedimentary or the Voltaian geohydrologic province underlies approximately 35 percent the country, centering around the Volta River and extending northward beyond the borders of Ghana to the Niger River. This is the most extensive sedimentary sequence in Ghana. The Paleozoic sedimentary basin is only a slightly better aquifer than the basement complex. There are, however, local occurrences of exceptionally good aquifers. Well depths average 25-40 meters with yields which vary greatly with rock type.

The Quaternary and continental terminal deposits can be divided into the coastal plain and the alluvial geohydrologic provinces. These are fair to good aquifers which might produce 10-150 cubic meters per hour. Well depth can be expected to be deeper in these areas. The extent of these aquifers is limited and they do not cover a significant portion of Ghana, though they do occur in areas of relatively dense population.

3.2.4.2 Groundwater Movement

Groundwater recharge in Ghana is dependent on irregular rainfall recharge increases to the south. Important seasonal fluctuations in the water table occur, particularly in the north. The groundwater system does not receive significant recharge from the river system in Ghana, so that once rainwater has reached the rivers as runoff it is virtually unavailable for recharge. Groundwater discharges through some springs into rivers and streams, for which aquifers provide a fair amount of base flow. At the coast some basins discharge into the sea and a reverse movement (sea water intrusion) may

take place in case of groundwater overdevelopment. Sea water intrusion is reported on the coastal plain.

Yield from Groundwater Storage

In many parts of Ghana it is difficult to obtain even adequate groundwater supplies because of the wide distribution of crystalline rocks in the Precambrian province. The safe yield, or natural recharge, which might be expected is a difficult figure to determine for these highly complex groundwater conditions. Generally speaking, groundwater from basement sources might be expected to yield sufficient water for rural needs but will not support a population of urban densities. Some sedimentary basins might be able to meet urban demands but they occur in low quantity.

3.2.4.3 Groundwater Quality

Groundwater quality in most areas is good, with less dissolved salts from basement groundwater than from sedimentary groundwater. In the north central part of the Voltaian sedimentary basin the water is likely to be highly mineralized. This appears to be a rather widespread condition, as indicated by salty water obtained from boreholes at Daboya, Tamale, and Makongso.

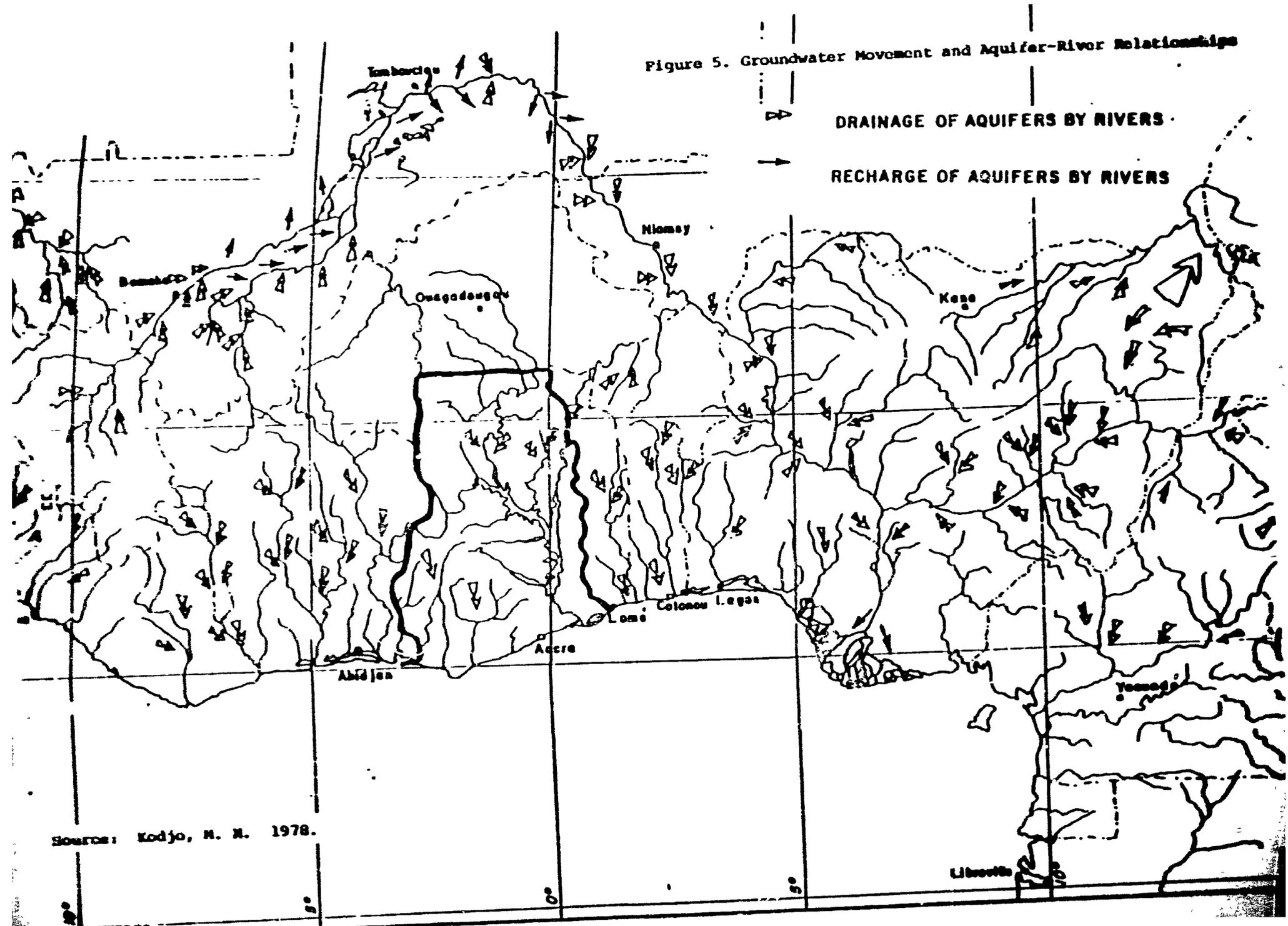
3.2.4.4 Use of Groundwater

In Ghana only the coastal plain and alluvial groundwater provinces are adequate for large scale irrigation. The Voltaian province and the basement complex are fair to poor for urban, industrial, or irrigation uses.

Groundwater development is an important government program, particularly as a means of insuring a safe supply of potable water to the population. Domestic use in rural areas is moderate in Ghana. There are several thousands of domestic wells in rural areas. Urban areas make use of some groundwater but no data is available on quantity of water drawn or number of wells.

Wells may be hand dug or drilled. Those which are dug by hand are generally operated by traditional water lifting methods, which may result in groundwater contamination and health hazards. Hand pumps are also used, especially on drilled wells. In Ghana a substantial number of wells have been equipped with pumps.

Figure 5. Groundwater Movement and Aquifer-River Relationships



Source: Kodjo, M. N. 1978.

3.2.5 Coastal Water

Ghana has 539 km of coastline. The majority of the industrial development and population is near the coast. No information on legislative regulation specifically concerned with coastal water or coastal water pollution was found in the international literature. Furthermore, little information concerning coastal areas was found at all except as related to population and industrial distribution.

Fishing villages lie all along the coast and in 1976 the catch was 195,800 metric tons of Atlantic Ocean fish. A significant portion of the population depends upon the sea for a livelihood. Fish are an important protein source. The majority of the catch remains in the country. More fish are taken from the sea than from inland waters though the gap is lessening as the Volta Lake industry increases. The fish along this Atlantic coastline are migratory so that problems arise in control of harvest, particularly as fleets from many countries harvest Ghanaian waters. Fishing for domestic consumption is most frequently done by seine from the shoreline. Considerable quantities of fish are harvested in this way. Cooperatives are set up by seine owners and managers.

There are two modern seaports, both of which are artificially constructed. The port of Takoradi is in the western region and the port at Tema is now part of the greater Accra region. The country has no natural harbors.

Industrial and urban wastes have been reportedly discharged directly into the sea. Pollution from rivers also flows to the sea. Coastal fisheries are being affected but the impact has not yet been quantified.

3.3 Flora ⁷

3.3.1 Introduction

West African vegetation is distributed in a number of distinct zones which run parallel to one another. These bands of vegetation lie across the north-south dry-wet climatic gradient. Rainfall patterns and amounts are the principal factors determining the range of the three main vegetation types: grassland, savanna and forest. The shortest rainy season and lowest average annual rainfall values characterize the desert regions of Ghana. At the other end of the scale, the coastal

⁷Source: Innes, R. R. 1977
Inter African Committee for Hydraulic Studies (CIAH). 1979.
IUCN. 1979.
Raturay, J. M. 1960.
Ghana (Government). 1976.
Ghana (Government). 1975.

some has the heaviest rainfall occurring over the longest period.

Other factors besides precipitation exert some influence over the type of vegetation that grows at a particular site. Temperature, humidity, wind, topography, soil type and condition, and human activities such as brush burning, cultivation and overgrazing by livestock all contribute to determining the nature of the vegetation cover. Dry-season fires, for instance, are largely responsible for the evolution of the Sudan savanna and Guinean savanna vegetation zones.

The present vegetation developed through a series of distinct plant communities which succeeded each other over the course of centuries. Climax communities develop in steady equilibrium with the overall environment and do not change unless compelled to do so by a change in the environment. Man's influence on the climax community has been so great that few, if any, of the existing plant communities are primary climax communities. The existing vegetation has been damaged, disturbed or destroyed by fire, flood, cultivation, overgrazing, cutting and industrial degradation to the point of change in the dominant plant species.

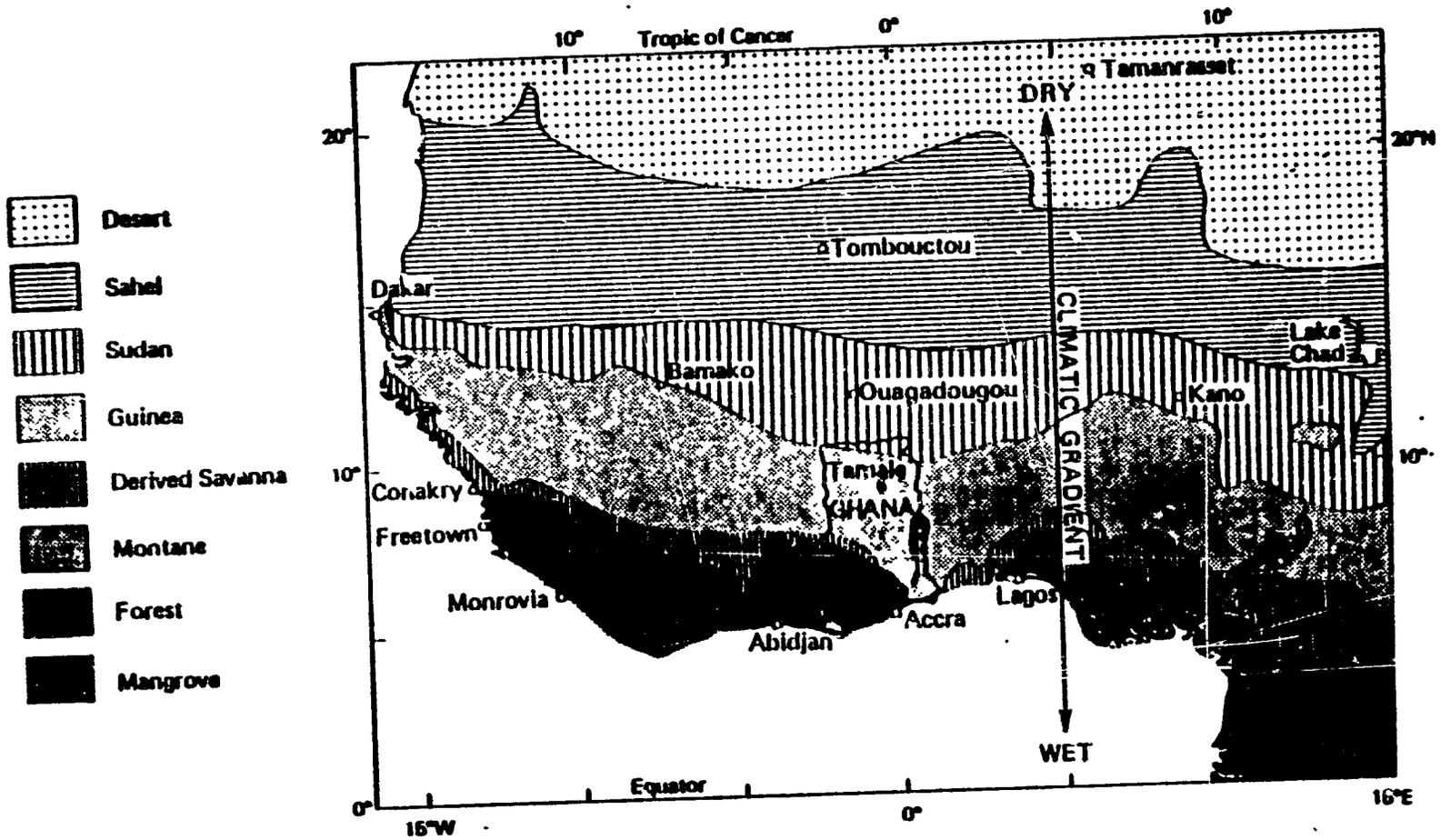
Approximately 30 percent of the country is closed forest, while 70 percent is savanna vegetation. Of the closed forest 16,853 sq. km. is Reserved Forest or permanent Forest Estate; 3,592 sq. km. is Unreserved Forest that is potential farmland; and the remaining 62,228 sq. km. is occupied by cocoa farms, food farms, bush or follows. In the savanna area 8840 sq. km. is Reserved Forest and 87,260 sq. km. is unreserved woodland. Grasslands, farms, and pasture equal another 60,762 sq. km. Controlling legislation emphasizes utilization, as outlined in Appendix IV. Protected areas exist and it is in such regions that areas of the original vegetation of Ghana still exist. The protected areas are discussed later in this report. Common problems in the maintenance of natural vegetation types are habitat destruction for cultivation and timber cutting for fuel and timber export. It has been reported that there are no remaining areas of "natural" forest as of 1975.

3.3.2 Natural Vegetation

The accompanying map divides the vegetation of Ghana into three major divisions: coastal savanna, forest, and the interior savannas. Strand and mangrove vegetation comprises a minor division. Each of these divisions are further subdivided. The international literature is somewhat inconsistent as to where boundaries for these divisions should occur, as might be expected from the intergrading nature of the systems. Furthermore the literature is inconsistent in names used in classification. The most commonly applied vegetation names are noted below.

Figure 6. Vegetation Zones of West Africa

38



Source: Innes, R. R. 1977.

Strand and Mangrove (Mangrove, West African Coastal Mosaic)

This vegetation type occupies a narrow strip of littoral sand or low coastal dunes, adjacent sandy soils on the landward side and filled in lagoon beds behind the dunes, river estuaries and lagoon margins, and the Volta River delta. Marshy tidal river banks tend to be dominated by mangrove thickets. Sandy shore margins are often planted in coconuts. *Rhizophora racemosa*, *R. harrisonii*, *R. mangle* and *Avicennia nitida* are the dominant woody species in this community. Dominant grass species are listed below.

on spray drenched sand

Sporobolus virginicus
Sporobolus robustus

on inland side of sand dunes

Aristida sieberana
Panicum repens
Tricholaena monachne
Leptothrium senegalense

on saline flats and lagoon shores

Paspalum vaginatum
Paspalidium geminatum

on the western strand and shallow structural white sand

Anadelphia afzeliana
Anadelphia tripspiculata
Rhytachne rothboellioides
Panicum congoense
Setaria anceps
Hyparrhenia mutica
Axonopus flexuosus

Coastal Savanna (West Africa coastal mosaic)

This vegetation type lies to the northeast and southwest of Accra in a strip running along the coast westward as far as Takoradi. Generally, the western extension of the coastal savanna area is quite open with scattered woody species and fairly extensive grassy areas. The area to the southwest of Accra is a dense thicket containing a few scattered patches of grass. The gently rolling Accra Plains to the east of the city are fringed with a belt of thicket but are mainly covered with open tree savanna. The woody elements consist of clumps of trees and shrubs perched on widely scattered termite mounds. This is a typical fire proclimax or "peppercorn" tree savanna. The clumps are prevented from spreading by frequent fires, poor soil conditions, and low erratic two-peak rainfall. Over the last 20 years this community has been modified by overgrazing and the introduction of the neem tree, *Asadirachta indica*. Natural thickets of woody species include *Chrysobalanus orbicularis*, *Diospyros tricolor*, and *Eugenia coronata*.

Where grass is dominant it is generally assumed that the grassland has been derived from rainforest or woodland by agricultural practices. Grass species are listed below.

fire proclimax on heavy black crackling clay
southwest

Vetiveria fulvibarbis (dominant)
Brachiaria falcifera (sub-dominant)
Andropogon canaliculatus (sub-dominant)

northeast

Schizachyrium sanguineum - with various sedges

fire proclimax on tropical grey earths
southwest

Schizachyrium schweinfurthii

southcentral

Monocymbium cerasiiforme (dominant)
Vetiveria fulvibarbis
Setaria sphacelata
Andropogon canaliculatus
Ctenium newtonii

fire proclimax marshy bottom land and floodplains of the Volta

Andropogon gayanus var. *gayanus*

After cultivation this land gives rise to broadleaved annual weeds followed by annual shortgrass, midgrass perennials, tallgrass and finally the fire proclimax stage as described above. This succession pattern occurs if the field is left undisturbed by grazing.

Forest (Tropical Rainforest, Guineo-Congolian Lowland Rainforest)

A reliable double peak rainfall regime with short dry seasons is responsible for the presence and maintenance of the permanent forest vegetation, which covers approximately one-third of the country. The forested area is in the southwestern part of Ghana, situated between the relatively dry coastal and interior savannas. A combination of factors, particularly shifting cultivation and the annual dry-season fires, are responsible for the steady encroachment of grassy tree savanna on the northern edge of the forest. In some areas encroachment starts with the appearance of a dense secondary growth of *Imperata cylindrica* on abandoned farmland, which fuels the dry-season fires.

The forest consists of a continuous stand of trees up to 50 meters high. About 200 different tree species grow to timber size in this closed forest; 30 of these species are merchantable. In most areas the species diversity has been reduced by the planting of economic species.

Tropical rainforests are generally mixed forests and it is easier to speak of plant families than of plant genera when describing the constituent vegetation. The forest tree species are dominated by members of the Leguminosae, Malvaceae, Moraceae, Myristicaceae, Sapotaceae, Sterculiaceae, and Ulmaceae. Smaller woody plants belong to the Annonaceae, Ebenaceae, Euphorbiaceae, Flacourtiaceae, Guttiferae, Ochnaceae, Olacaceae, Rubiaceae, Sapindaceae, and Violaceae.

With the exception of the introduced giant bamboo, *Bambusa vulgaris*, forest grasses are of little economic importance as a constituent of the flora at ground level. There are a number of small grassy glades isolated in the tall closed forest similar in composition to those found in the western coastal savanna. These are thought to be relict populations left behind when the savanna retreated north under a reverse climatic swing in the late Pleistocene. These populations remain on mountain tops in very shallow soil overlying impermeable substrata. The forest has not been able to dominate these sites because soil conditions and water relations are locally unfavorable.

forest glade grasses

Andropogon curvifolius
Andropogon perligulatus
Andropogon tectorum
Eragrostis scotelliana
Loudetia kagerensis
Panicum lindleyanum
Rhytachne roltboellioides

true forest (deep shade) grasses

Commelinidium gabunense
Guaduelia macrostachys
Leptaspis cochleata
Olyra latifolia
Streptogyna crinita

Interior Savannas

The interior savanna reaches from the edge of the forest to the northern frontier, with an extension running southeast to the Volta delta area. Two major zones occur within this area. The Derived Savanna zone lies adjacent to the forest and runs the entire length of the Guinea Savanna zone. The climate of the area changes from a double to a single-peak rainfall regime to the north and east of a line running through Kete Krachi and Bole. It is probable that much of the area to the south and west of that line was at one time covered with closed forest which has since disappeared under the impact of fire and cultivation.

The whole area is subject to extreme prolonged soil erosion and leaching. Soils are shallow and infertile. Bottom lands contain a buildup of heavy silts and cracking clays. Severe

annual drought aggravated by the harmattan wind blowing from the Sahara effectively excludes all but the hardiest types of trees. The vegetation is in a state of near dormancy for several months of the year. The grassy components are converted into a highly combustible standing fuel. The two major influences on vegetation are cultivation and fire. Many areas are at disclimax stage because of the impact of man upon the environment.

Derived Savanna (Lowland Rain, Forest-secondary Grassland Mosaic)

The derived savanna is a transitional zone between high closed forest and open tree savanna. As can be expected in an area of transition, the vegetation is in a delicate state of balance with the controlling factors of the environment. This is a community which quickly responds to environmental changes. Small alterations may induce rapid and appreciable changes in the community structure. Much of this zone is fire proclimax savanna woodland with a light, closed or partially closed canopy at a height of 18 to 24 meters and a ground cover of tall shade-tolerant grasses and forbs. Tree species include those smaller components of the forest tree flora. The grass species which first invade after disturbance are *Imperata cylindrica* and *Pennisetum purpureum*.

characteristic grasses of derived savanna

Andropogon guyanus var. *squamulatus*
Andropogon macrophyllus
Andropogon tectorum
Beckeropsis unisetata
Chasmopodium caudatum
Rottboellia exaltata
Schizachyrium sanguineum

Guinea Savanna (Woodland, Wooded Savanna, Sudanian woodland)

Fire, cultivation, and grazing are the major influences on this vegetation. In the guinea savanna there are no known relicts of the climatic vegetation zone. There are a few small relict communities which appear to be subclimax vegetation types, many species of which are subject to fire and only remain in protected habitat but are restrained from reaching full climax by lack of seed. Genera in these few areas include *Anogeissus*, *Andira*, *Bombax*, *Celtis*, *Combretum*, *Diospyros*, *Ficus*, *Khaya*, *Maytanssus*, *Sclerocarya*, and *Sterculia*. Shrubs include *Allophylus* and *Feretia*. These communities are dense closed-canopy woodland to a height of about 18 meters and a shrubby ground cover almost free of grasses. Such communities clearly indicate that the climate will support woodland or savanna woodland if disturbance factors were excluded. These areas, known as fetish groves, are important as indicators of impact but are too restricted to serve as major vegetational resources.

The major cover of the upland guinea savanna zone is a fire controlled tree savanna community of broadleaved deciduous trees densely distributed in a continuous cover of perennial bunch grasses and forbs. The crown reaches 12-15 meters but seldom forms a closed canopy. The fire proclimax tree species include a few of those fire-tolerant trees of the fatish groves. Also included are the highly fire-tolerant genera *Azobila*, *Eridelia*, *Butyrospermum*, *Daniellia*, *Entada*, *Gardenia*, *Isoberrhinia*, *Lannea*, *Parkia*, and *Pterocarpus*. Grass cover is extremely important in this habitat.

on dense shade deep upland soils (tall grass)
Andropogon garanus var. *bisquamulatus*
Andropogon tectorum
Beckeropsis uniseta

on open, shallow dry upland soils usually lateritic (this is the typical short grass guinea savanna grass assemblage)
Andropogon ascirpodis .
Andropogon schirensis
Brachiaria jubata
Ctenium newtonii
Monocymbium cerasiiforme
Panicum phragmitoides
Schizachyrium sanguineum
Schizachyrium schweinfurthii

on extremely dry upland shallow soils
Loudetia flavida
Loudetia simplex
Loudetia arundinacea
Loudetiopsis scaettae

The lowland guinea savanna vegetation is found in moister habitats. The upland species disappear and give way to marshy or swampy bottomland tree savanna or to open savanna grassland. Of the upland trees only *Khaya* and *Daniellia* tolerate the moist conditions. In seasonally marshy habitats *Terminalia macroptera* and *Mitragyna inermis* are dominate.

Lowland grasses

upslope
Schizachyrium schweinfurthii
Monocymbium cerasiiforme

at base of slopes
Andropogon canaliculatus
Andropogon perligulatus
Hyparrhenia cyanescens
Hyparrhenia rufa
Panicum fluvircola
Schizachyrium sanguineum
Urelytrum muricatum

understorey
Panicum parvifolium
Panicum pubiglume
Schizachyrium brevifolium
Schizachyrium platyphyllum

on open fire-proclimax swamp or marsh savanna (tree species may be lacking)

Andropogon guyanus var. *guyanus*
Andropogon guyanus var. *sequamulatus*
Andropogon tenuiberbis
Chasmopodium caudatum
Jardinea congoensis
Loudetia ambiens
Loudetia phragmitoides
Loudetia thordii
Setaria anceps

Besides the upland and lowland areas within the savanna there are a number of unique local or scattered minor vegetation associations which respond to restricted environmental conditions. In the extreme northwest and the northeast there are restricted areas of the more open woodland and wooded savanna dominated by *Acacia* species. These zones are at their southern climatic limit and are present only in the dry northern area of Ghana.

3.4 Wildlife and Protected Areas ^{8/}

3.4.1 Introduction

Overhunting and land use practices which lead to destruction of habitat have caused serious depletion of nearly all game species in Ghana. Early hunting techniques were particularly devastating to species of economic importance and included the shooting of females and young animals throughout the year and night-hunting with blinding lamps. In the last 10 years the government of Ghana has adopted a wide-reaching program of wildlife conservation. The wise use of wildlife, with prevention of waste and despoilment and maintenance or restoration

⁸ Source: Curry-Lindahl, K. 1969.
IUCN. 1979.
IUCN. 1976.
IUCN. 1971.
Johnson and Johnson. 1977.
Ghana (Government). 1976.
Ghana (Government). 1975.
U.S. Agency for International Development. 1979.
U.S. Department of the Interior, Fish and Wildlife Service. 1979.

of the quantity, quality and usefulness of wildlife is the stated goal of this program. Legislation exists to protect wild species but enforcement is inadequate. It has been reported that both law enforcement officials and the public are ignorant of game laws and the animals protected, while the courts have proved to be somewhat sympathetic to offenders. Throughout the closed season bushmeat is available for sale in the markets. As much as 73 percent of locally produced meat may come from wild animals, particularly from some of the smaller species such as grass cutters and giant rats (*Crice-tomys*). Protection of larger animals is easier to accomplish, since hunting of large animals requires specific skills and equipment, while smaller species may be taken by snare.

The over-utilization of wild animals poses a serious problem. The accompanying list of animals sold as bushmeat indicates not only the area in which use is heaviest but also relative ease in capturing the animals. A conservative estimate of the 1971 yield of bushmeat in Ghana is 8,486 tons valued at US \$7,358,172. Such a good market for wild meat seriously limits any conservation effort which does not consider the protein needs of the population. Ghana is working with the International Union for Conservation of Nature and Natural Resources (IUCN). Guidelines are being implemented with progress in research and conservation showing positive results. The future of wildlife in Ghana lies in specially declared reserves and conservation areas. Outside these areas some species of small mammals can survive with the current system of land use but larger mammals seem doomed to extinction. Five species of mammals are listed as threatened in the IUCN 1976 Red data Book: Olive Colobus (*Colobus verus*), Chimpanzee (*Pan troglodytes*), African Wild Dog (*Lycaon pictus*), Leopard (*Panthera pardus*), and the West African Mantee (*Trichechus senegalensis*).

3.4.2 Protected Areas

Ghana has made the decision to convert its last blocks of primary forest into national parks. There is a good network of protected zones throughout the country and the number of protective legislation and attempts at enforcement. There are 12 protected areas in Ghana with a total area of 1,131,204 hectares. Three of these areas, (Bui, Digya, and Mole) are listed as meeting the criteria for inclusion in the U.N. National Park system. Bia National Park, established in 1974, may qualify for inclusion if it meets the standards of protection, size and maintenance, because of its unique rainforest flora and fauna.

3.4.2.1 Mole National Park (446,000 hectares)

This park represents habitats of the Sudanian (Guinea) woodland savanna. As such it is to a great extent a

**Table 5. Wild Animals of the Bushmeat Trade of Ghana
(listed in order of importance)**

Dumaga 1964/65 (Northern Guinea savanna)	Techiman 1967/68 (Semi-deciduous forest)	Accra 1968/69 (Coastal plains savanna)
1. Warthog	1. Baboon	1. Grasscutter
2. Baboon	2. Warthog	2. Giant Rat (<i>Cricetomys</i>)
3. Hartbeest	3. Grasscutter	3. Royal Antelope
4. Bushbuck	4. Hartbeest	4. Bushbuck
5. Crowned Duiker	5. Kob	5. Bat
6. Aardvark	6. Bushbuck	6. Green Monkey
7. Grasscutter	7. Roan Antelope	7. Crowned Duiker
8. Roan Antelope	8. Aardvark	8. Black Duiker
9. Buffalo	9. Waterbuck	9. Red River Hog
10. Waterbuck	10. Oribi	10. Monitor Lizard
11. Kob	11. Crowned Duiker	11. Togo Hare
12. Patas Monkey	12. Green Monkey	12. Mongoose
13. Crested Porcupine	13. Patas Monkey	13. Tree Hyrax
14. Oribi	14. Red-flanked Duiker	
15. Green Monkey	15. Crested Porcupine	
16. Colobus Monkey	16. Buffalo	
17. Crocodile	17. Red River Hog	
18. Reedbuck	18. Reedbuck	
19. Hunting Dog	19. Bay Duiker	
20. Giant Forest Hog	20. Colobus Monkey	
	21. Royal Antelope	
	22. Crocodile	
	23. Elephant	
	24. Genet Cat	
	25. Monitor Lizard	
	26. Hippopotamus	
	27. Puff Adder	
	28. Civet Cat	
	29. Yellow-backed Duiker	
	30. Tree Pangolin	

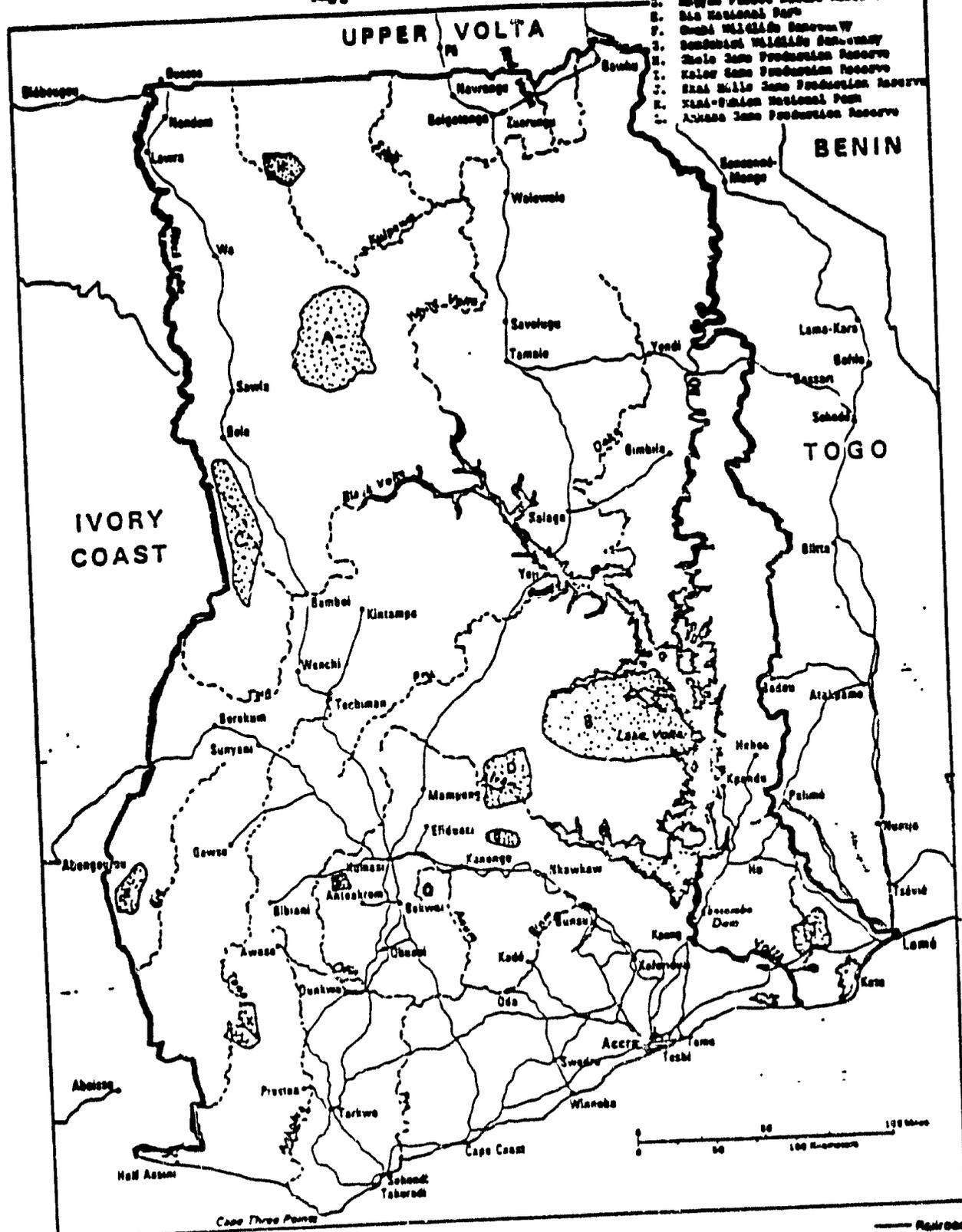
Source: IUCN. 1971.

Ghana

Figure 8. Protected Areas of Ghana (approximate locations)

Isolated Areas of Ghana Legend

- 1. Nene National Park
- 2. Ligo National Park
- 3. Didi National Park
- 4. Nkyen Forest Reserve
- 5. Bia National Park
- 6. Kwabena Wildlife Sanctuary
- 7. Kalo Jams Production Reserve
- 8. Kalo Jams Production Reserve
- 9. Kalo Jams Production Reserve
- 10. Kalo Jams Production Reserve
- 11. Kalo Jams Production Reserve
- 12. Kalo Jams Production Reserve
- 13. Kalo Jams Production Reserve
- 14. Kalo Jams Production Reserve
- 15. Kalo Jams Production Reserve
- 16. Kalo Jams Production Reserve
- 17. Kalo Jams Production Reserve
- 18. Kalo Jams Production Reserve
- 19. Kalo Jams Production Reserve
- 20. Kalo Jams Production Reserve



Scale 1:500,000
 Lambert Conformal Projection
 Standard Meridians 0° and 33°
 Scale 1:500,000

— Railroad
 — Road
 ↑ Airport

"fire made" landscape where the balance between trees and grasses is maintained by the frequency of burning. It is reported that fire sweeps the park every year. This creates an orchard-like savanna landscape. The following plant communities are represented: middle slope (*Burkea africana* - *Nyparrenhia* spp.) ; upper slope (*Betarium microcarpum*, *Loudetia simplex*); top slope (*Isobertinia doka* - *Loudetiopsis scaettae*); and scarp (*Strychnos spinosa* - *Ischaemum hirsutum*). There are also areas of denser woodland and gallery forests.

Wildlife which had formerly been seriously depleted by tsetse fly control and commercial and subsistence hunting is well protected at the present time. Primates include Western Baboon, Western Black-and-White Colobus, Vervet Monkey, and Patas Monkey. Carnivores include Side-striped Jackal, Wild Hog, Spotted Hyena, Serval, Caracal (very rare), Lion and Leopard. Ardvark and Elephant are also present together with a variety of ungulates including Bushbuck, Buffalo Common Waterbuck, Buffon's Kob, Reedbuck, Roan Antelope and Oribi. Raptors include Long-snouted and Nile Crocodiles and the Nile Monitor Lizard. Birdlife is plentiful. The Mole is the most important area in Ghana for game viewing.

3.4.2.2 Digya National Park (312,000 hectares)

The predominant vegetation is savanna woodland with transitional forests and gallery forest along most streams. Dominant trees include *Anogeissus leiocarpus*, *Antiaris africana*, *Triplochiton scleroxylon*, *Ceiba*, *Albizia*, and *Sterculia*. This park is situated on the shore of Lake Volta. Much of the area was inhabited and there are still approximately 1,000 villagers to be resettled outside the park's limits. The area is currently well protected.

The filling of Lake Volta not only created a site for this park but created new habitat for animal populations. One use of this park is for studying changes in the biotic community. Fauna include Ground Squirrel, Crested and Brush-tailed Porcupines, Giant Pangolin, Lesser Galago, Western Baboon, Sooty Mangabey, Vervet Monkey, Patas Monkey, Side-striped Jackal, Wild Ganet, Mongoose, Spotted Hyena, Lion, Leopard, and a number of ungulates. In aquatic habitats there are Clawless and Spotted-neck Otters, Hippopotomus, and Long-snouted, Nile and Dwarf Crocodiles. Present fauna has been seriously reduced by past hunting.

3.4.2.3 Bui National Park (207,000 hectares)

Situated near Wenchi and the border with Ivory Coast, this park is another savanna woodland community, and is still under development. The problems of resettlement

and the game resources are similar to those of Digya National Park. The aquatic community is entirely riverine rather than lake. The Black Volta River runs through the park.

3.4.2.4 Kogyae Strict Nature Reserve (32,000 hectares)

Kogyae Reserve near Ejura is a purely research reserve. Located partly in forest and partly in savanna, the area is not intended as a tourist facility or as a game production reserve. The area is well protected and still maintains populations of its original fauna, although in low numbers. Species composition is similar to that of Digya National Park. Breeding stock is being captured in Mole and released in Gbele.

3.4.2.5 Bia National Park (7,680 hectares)

Bia National Park is a fully protected area situated in the western region. It is unique in that it is the only park in the high semi-deciduous rainforest. This is an extremely important reserve because the vegetation is still virgin and typical of the *Antiarsis-Triplochiton* zone. Among the fauna are Chimpanzee, Black-and-White Colobus, Olive Colobus, and a number of other forest and woodland species which have been seriously affected by the destruction of Ghana's high forest zone and by hunting. Some species have been exterminated in the area.

3.4.2.6 Owabi Wildlife Sanctuary (7,000 hectares)

Owabi wildlife sanctuary near Kumasi is being developed as a wildfowl sanctuary and as an education area.

3.4.2.7 Bomfobiri Wildlife Sanctuary (5,000 hectares)

There may be a name confusion of this wildlife sanctuary near Kumasi with the Boufou Wildlife Sanctuary reported in the international literature. There is no information about this sanctuary other than that it is well protected.

3.4.2.8 Gbele Game Production Reserve (54,000 hectares)

Gbele is the largest and the farthest north of the game production reserves. It is well protected but game stocks continue to be low. This area is specifically set aside to reserve viable breeding stocks of game for the purpose of bushmeat production. Species include various ungulates as well as their predators, in an attempt to maintain a natural biotic balance.

3.4.2.9 Kolor Game Production Reserve

Reported in the international literature to be well protected with low game stock. No other information is available.

3.4.2.10 Kalakpa Game Production Reserve or Strict Nature Reserve

This reserve located near Ho is under intense protection to save the existing breeding species.

3.4.2.11 Shai Hills Game Production Reserve

Situated on the Tema-Akusembo road, this reserve is being fenced to provide maximum protection for the animals in it. Species from Mole National Park are being introduced here.

3.4.2.12 Nini-Suhien National Park (16,278 hectares) and adjacent Ankasa Game Production Reserve (33,802 hectares)

Located in a true evergreen rainforest, these protect and utilize an extremely scarce habitat which once covered 10 percent of Ghana. This is a dense lowland humid forest. Conservation is good in these protected areas, which were established in 1976.

3.4.2.13 Bia West (1,654 hectares) and Bia South (6,002 hectares)

These are newly created Game Production Reserves in semi-deciduous rainforest.

3.4.2.14 Proposed National Parks

There are three proposed parks: Krokosua National Park in *Celtis-Triplochiton* semi-evergreen rainforest, and Boin National Park and Yoyo National Park, both in seasonal rainforest.

3.4.3 Other Important Habitat

Mangrove covers extensive areas in the delta of the Volta River and in a narrow belt along the western coast. Manatee and White Dolphin may still survive. Common problems in mangrove areas include woodcutting for charcoal and conversion to rice fields, pollution, poaching, fishing and hunting. No fully protected area has been established or is being considered at this time.

Wetland communities have not been given official protected status in Ghana. These communities are particularly susceptible to degradation by drainage for cultivation, overgrazing and fishing, and are extremely important to migratory avifauna.

3.5 Minerals and Energy ^{9/}

3.5.1 Introduction

The mineral and energy resources found in Ghana are unsurpassed in both balus and variety by those found in most West African countries. Many of these resources have been and are being exploited. Exploration for new deposits and development of these non-renewable resources are encouraged by the government. The mineral industry of Ghana makes a minor but significant contribution to the world mineral economy and forms an important part, 31 percent, of Ghanaian export trade. The minerals industry produces 2.3 percent of the GDP and is second in importance only to agriculture. Seventy-two percent of that figure or 11% of total export earnings is from the gold industry. Approximately 30,000 people were employed in the mineral industry in 1974.

The development and continuing growth of the mineral and energy industry has a significant impact upon all components of the environment. Governmental policy and legislation both encourage development and attempt to ameliorate impacts.

In general, as can be seen from the accompanying map, the majority of highly economic mineral deposits and processing facilities are located in the southern one-third of Ghana. The far north and western areas of the country have valuable deposits but these areas are both underexplored and geologically somewhat less likely to produce the great wealth of the south. Central and eastern Ghana are least likely to have economic mineral deposits.

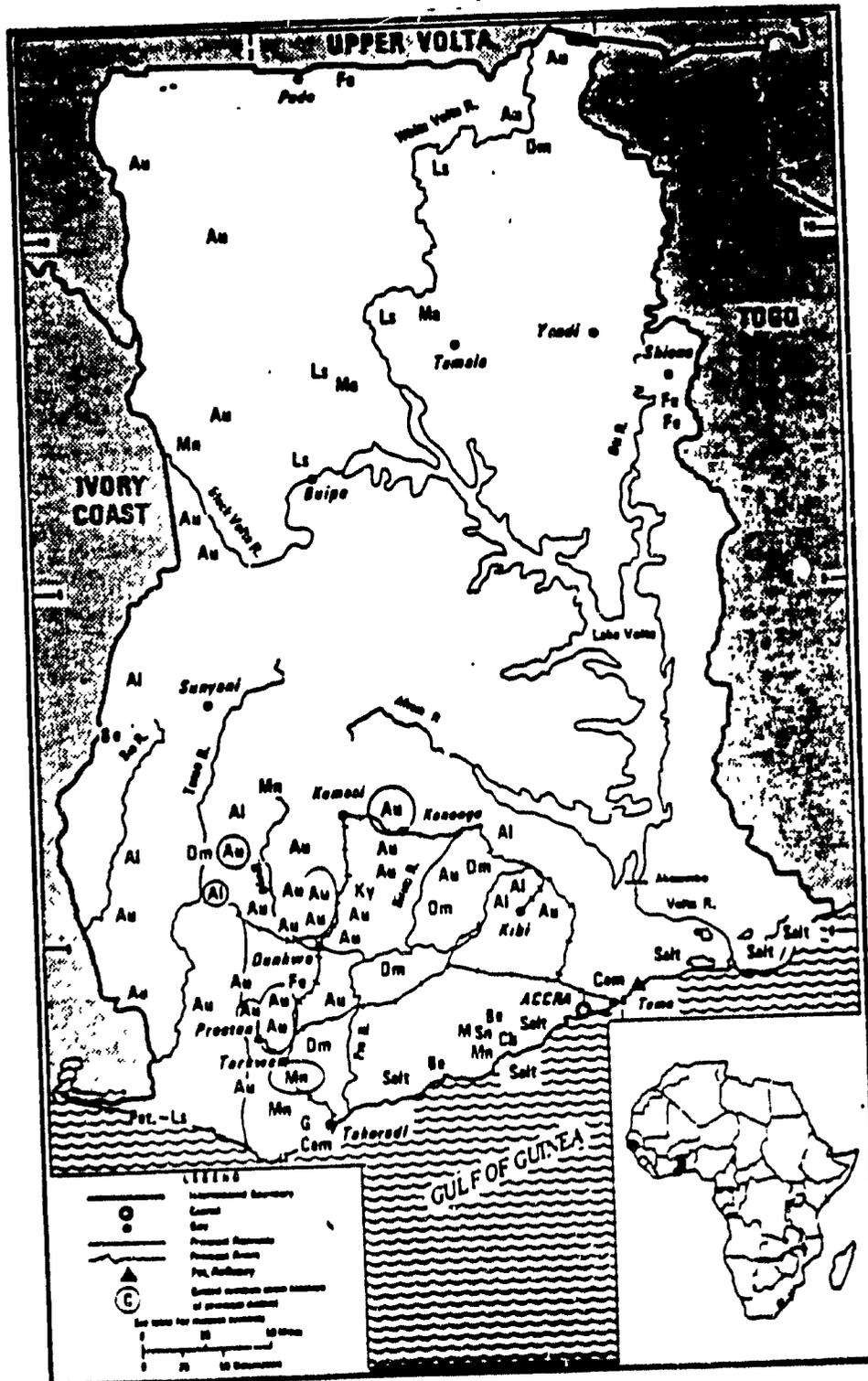
3.5.2 Economic Minerals (abbreviations refer to location on map, Figure 9)

Gold (Au)

Traces of alluvial gold are common in Ghana and there are many auriferous quartz lodes. There are developed and undeveloped or underdeveloped deposits throughout the mineralized areas of the country. Gold deposits in West Africa have been the subject of several cycles of erosion and deposition so that

⁹Source: Boateng, E. A., 1966.
Bota, K., J. Weinstein and J. D. Walton, Eds. 1979.
Europa Publications. 1980.
Geological Survey of Ghana. 1962.
Johnson H. and J. Johnson. 1977.
Kaplan, I. et al. 1971.
Ghana (Government). 1975.
U.S. Bureau of Mines. 1976.
U.S. Bureau of Mines. 1975.
U. S. Department of State. 1978.

Figure 9. Mineral Industries of Ghana



Source: U.S. Bureau of Mines. 1976.

gold traces are widespread, which may tend to confuse exploration efforts. Ghanaian gold deposits are less than 1 percent of the total world resource but the industry, of which 100 percent is exported, produces 2 percent of the world output.

Diamond (Dm)

Major diamondiferous areas occur in the southwest watersheds of the Pra, Birim and Senua Rivers. Isolated diamond deposits occur along many rivers, particularly in the southwest, and scattered deposits occur in the west and far north. Some deposits were inundated when Lake Volta was formed. The diamond deposits of Ghana make up 2.5 percent of the total world resource. Most of these resources are of industrial quality. The industry produces 6 percent of the world's output, 100 percent of which is exported.

Bauxite (Al)

Bauxite deposits are restricted largely to the southwest where they are widely distributed, with the greatest concentration being around Awaso. Extraction and processing of this relatively shallow, widely-dispersed mineral, which is smelted into aluminium, results in extreme environmental degradation in the areas of mines or of processing operations. Ghana has a 1.5 percent share of the world bauxite supply, and produces 0.5 percent of the bauxite and 1.2 percent of the aluminium output of the world. Approximately 92 percent of this production is exported. Aluminium amounts to 13 percent of Ghana's total export earnings while bauxite accounts for less than 1 percent.

Manganese (Mn)

Manganese deposits are restricted to the southwest, with major deposits near Tarkwa. Only one deposit is presently under development. The Nsuta mine is one of the largest manganese mines in the world. It is producing 1 percent of the total world output, all of which is exported.

Other Deposits

There are a number of other resources of minor economic importance, including low-grade iron ore in northern and western Ghana, limestone for cement production, and marine salt.

3.5.3 Energy

Oil exploration is being conducted both offshore and in the Volta basin. The exploration is being conducted entirely by foreign companies. Both areas show possibilities. In January of 1979 one well began producing at the rate of 3,000 barrels per day from the continental shelf.

All of Ghana's crude petroleum needs have been imported. The Tema oil refinery has a 25,000 barrel-per-day capacity and supplies most local needs. Approximately 25 percent of the country's petroleum products are exported.

Generation of hydroelectricity from the Volta dam at Akosombo began in 1966. In 1972, the Volta River Authority supplied 99 percent of the electricity utilized in Ghana. Sixty percent of the output of that dam is purchased by the VALCO aluminum smelter, which was an integral part of the Volta River Project. The smelter provides a guaranteed market for Volta electricity and ensured foreign loans to raise the dam. Volta power is also sold to Togo and Benin (formerly Dahomey). Transmission lines encircle southcentral Ghana. The present capacity of the dam is 792 megawatts.

Downstream from Akosombo a second plant is situated at Kpong with a capacity of 160 megawatts. This second plant is necessary to meet 1981 demands. A third hydroelectric scheme at Bui on the Black Volta is currently under study.

Local thermal power stations provide 144 megawatts of electricity. An atomic energy commission has been set up to facilitate development and training for nuclear power generation if the country decides on that option.

Only 20 to 22 percent of Ghana's population enjoys electricity. Wood is the main source of energy in rural areas for domestic purposes while charcoal is used in urban centers and large towns. Ghana is far from energy self-sufficiency. Diversification into less conventional energy sources may prove to be the best development plan in the future.

Solar energy is being studied under the direction of the Council for Scientific and Industrial Research (CSIR). Modern solar devices such as heaters and dryers are now in varied stages of research and development. Direct sunshine is also utilized for all kinds of drying processes, especially for agricultural products, meat and fish.

The windpower potential for Ghana is thought to be high. That source would seem to be particularly appropriate to the energy needs where the population is somewhat dispersed. Literature resources do not indicate the amount of wind energy utilized nor the state of that research in Ghana. However, sources which cover the whole of West Africa indicate that the prospects for development of such a resource are high.

4.0 Environmental Problems

4.1 Interactive Problems^{10/}

The problems considered for this report are the major environmental problems facing Ghana. It is always true that environmental problems are human problems but this is perhaps more evident in a country so closely tied to its natural resources. An attempt has been made to divide the environmental problems into interactive subunits but in reality there is no division within each problem. Each system is an integral part of every other. Discussion of these problems in the international literature is somewhat weighted towards those impacts brought about by long-term utilization of natural resources for subsistence living rather than the impacts of industrialization and economic development. This is understandable first because the slowly-built impacts of subsistence living have become clear with time. Second, those impacts related to purely economic utilization

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- ¹⁰Source: Abudu, A. O. 1976.
Beals, R. 1967.
Benneh, G. and R. Dodoo. 1975.
Boateng, E. A. 1966.
Campbell, D. J. and W. H. Renwick. 1975.
Charney, J. G. 1975.
Chinnery, W. A. et al. 1965.
Dickson, K. B. 1969.
Dickson, K. B. 1968.
DuBois, V. D. 1973.
Ganley, J. P. 1976.
Ghana (Government). 1976.
Hill, P. 1970.
Innes, R. R. 1977.
Johnson, H. and J. Johnson. 1977.
Kadambi, K. undated.
Kaneda, H. 1973.
Kaplan, I. et al. 1971.
Mensah, G. G. 1976.
Nicholson, S. E. 1978.
Prothero, R. M. (ed) 1972.
Surkwa-Mills, T. O. et al. undated.
U.S. Agency for International Development. 1980.
U.S. Agency for International Development. 1979.

of natural resources tend to be under-reported or hidden. Often those impacts build quickly so that it is important to consider possible degradation of the environment early in the planning stage of any new project.

The major climatic influences which affect Ghana probably became similar to present conditions about 5,000 years ago. Minor changes over the last few hundred years have left little evidence on the landscape, probably because the most overwhelming condition is that of variability of precipitation. The natural vegetation is adapted to the climate. The species which occur survive because climatic conditions are compatible with their physiology. Despite the adaptability of the natural vegetation it is evident and well-reported that desert lands are encroaching upon the savanna and the savanna is encroaching on areas which were previously forested. This is apparent not so much from climatic changes as from changes in vegetation and soil. Notable changes in vegetation are occurring which leave progressively larger areas of the savanna resembling the more xeric desert in the north. Large stretches of forest have changed to savanna in the south. The absolute number of plants has decreased in response to cultivation, cutting, burning grazing and, in the north, to drought. This has created a more open aspect of the land. The lack of vegetative cover has left the soils exposed. The impact of exposure is an increase in all types of erosion because winds tend to make vast quantities of soil airborne and rains tend to be sudden and intense.

Without vegetation the water-holding capacity of the soil is decreased and splatter and washing of soil by rain is increased. This causes surface compaction of the soil which then is less able to absorb water. With less infiltration there is even more erosion. As the land becomes progressively degraded the soil will be crusted at the surfaces, with areas of erosion where large quantities of soil have been transported from the area. Sediment loads in streams during flood season will be high, degrading that water resource at a time when it could be most useful. Lowered infiltration rates affect groundwater recharge as well.

It is quite possible that this shift towards a more desert-like environment may in fact feed back into the overall climatic system. Some investigators, among them Charney (1975) and Campbell and Renwick (1975) feel that the increased openness will increase the surface albedo (the reflectivity of the surface of the land), which leads to a decrease in net incoming radiation, and an increase in radiative cooling of the air. As a consequence, the air would sink to maintain thermal equilibrium by adiabatic compression. The result is cumulus convection, and associated rainfall would be decreased. The decreased rainfall would enhance the original decrease in plant cover. This is particularly important in the north where stretches of land have been left bare of vegetation. It is also important around Lake Volta. It has been reported that the large expanse of that highly reflective lake is causing a shift in cloud pattern and a belt of increasing aridity around the lake that was not present in the environment of the river. This development of desert-like conditions

where none had existed before is termed desertification. The shift towards savanna away from forest in the south has not yet been labelled in the literature, although it is a response to the same mechanisms.

Ghana has a man-made biotic environment. Archeological records indicate that forest and closed wood land once covered the entire country and that the population of the area is the savanna was once much greater than it is at present. Oral tradition and memory of the country's older people confirm that in very recent times the forested area was far more extensive than it is currently. Careful experimentation has shown that with the exclusion of fire and other impacts of man forest vegetation quickly returns to the interior savanna. These changes continue and may not be avoidable under the pressure of an expanding population with expanding requirements. Basically, the problems and contradictions implied in Ghana's human geography are related to the division of the country into two broadly contrasted physical regions: savanna and forest. The division, originally latent, was made real through the nature of mans interference with the natural vegetation.

The symptoms of a population out of adjustment with the environment are evident in Ghana, for the pressure exerted on human and environmental resources are causing the resources to deteriorate. Land shortages, soil erosion, reduced fertility, decreased yields, restricted production with recurrent food shortages, limited cultivation of cash crops and increasing pollution both cause and are caused by social changes such as migration. Again, all these problems are interactive and cannot be separated one from another.

4.1.1 Agriculture and Livestock

Smallholder staple food crop farming in Ghana depends entirely upon the hoe, cutlass and fire. Generally it approaches subsistence level though each farmer produces some surplus for market. This surplus is used to support the public sector, thus leaving no surplus for expansion or experimentation with new techniques. With the lack of equipment to clear new land, slash and burn techniques are a commonly practiced method of land preparation. The ash from the burn acts a sudden burst of nutrients available to the first year's crop. Initial yields may be high but successive yields are drastically reduced. After a short period of time the land is allowed to remain fallow for a number of years. Some natural vegetation and fertility is restored by this process. Burning the land is the cheapest and least laborious method of land clearing. However, there are a number of problems inherent in the cycle of slash and burn agriculture followed by a fallow period.

In the more wooded areas of the savanna the burning itself may be a problem. It may get out of control and threaten either neighboring crop land or land the farmer is unable to use himself.

Deliberately set fires for non-agricultural purposes also complicate the impacts. Hunters set fires in pursuit of wild game. This is a hunting technique for which it has been hard to enforce regulations. Herdsmen frequently set fires to the coarse tall grass left over at the end of the growing season to promote a flush of acceptable green dry season grazing. Fire followed by grazing of the sprouting new leaves places a heavy strain on the plants and may result in the death of the grazed species.

Lands that have been burned but not used and lands that are fallow are highly susceptible to erosion. Topsoil may be seriously depleted. Water and wind erosional processes will both have noticeable impacts.

Shifting cultivation or recurrent cultivation is the most common form of agriculture practice in Ghana. Nearly all agriculture is conducted in this manner. This system of bush fallow or bare fallow superimposed on a system of communal land tenure is common in the interior savanna. Settlements are small and widely dispersed. Cultivated and grazed areas are interspersed, taking advantage of slight shifts in environmental parameters which make one activity or the other more favorable.

The fallow system depends upon a course of fallow years to restore fertility. The need for new arable land has increased but little new land is available; as a result the fallow years have been reduced and the soil fertility has declined. The long bush fallow system of 12 to 20 years has shrunk to five years or less. Regenerating trees and shrubs no longer have sufficient time to restore soil fertility before the next cultivation begins. At the same time the supply of uncommitted land is progressively reduced as increasing numbers of people seek to secure their existence by farming. Finally the point is reached when no more land is available for communal allocation and ownership becomes fixed. This is a transition from long cycle bush fallow under communal ownership to short-cycle bare fallowing under private ownership.

The system of fallows, particularly bare fallows, leaves the soil exposed to erosional processes. Further, the system does not allow for a build up of soil organic matter so that soil structure deteriorates quickly with the shortening fallow period.

In the extreme north and northwest where soils are genetically of a higher quality and utility a system of intensive continual farming is conducted around family compounds. In those areas the population is quite dense. The land is all under private ownership with small parcels averaging three to six acres. Nutrients are added to the soil in the form of animal and human waste. Fields at a distance from the compound may be fallowed. These cultivation systems are an efficient way of meeting the needs of a small population. As

urban populations increase, the land resources are drained beyond their capacity to support the dependent population. These small farms produce as much as 85 percent of the total farm output.

Cocoa farming and to a lesser extent other commercial farming produce the majority of the country's agricultural wealth. These crops are forest zone crops and have resulted in progressive clearing of the forests. In some cases some forest species are retained, which helps maintain soil fertility, but usually the forest is cleared by fire before cultivation of cocoa. Other crops may be intermixed. Again this is a system of small holding, with farmers often controlling one to three acres of land and often living some distance from their holdings.

All of these farming techniques have severe consequences for the land when pressured by increasing population requirements. Land has been set aside for reserves but every year purposeful encroachments for agricultural expansion are made on these reserves.

Livestock rearing in Ghana does not imply pastoral nomadism as it does in much of West Africa. Livestock is owned by farmers and herdsmen are employed to tend the herds. Grazing land is not owned. Grazing may take place in any area not under cultivation. The herdsmen are usually Fulani hired for their expertise with the herd. Owners may not have any direct contact with the herd, as for instance is the case of cocoa farmers who invest in this form of wealth as a hedge against a bad cocoa market. Livestock herds are restricted to areas free from tse tse fly infestations. Until the advent of increased veterinary services cattle were a very minor economic commodity used usually for ritual and to store wealth but seldom as a direct commercial product. With the increase in livestock health facilities and water supplies herds are more often being kept for economic gain. Ghana cattle census shows a 114 percent increase between 1961 and 1964.

In this situation where land and water are not owned, decreasing the herd size does not save the land but only puts the herdsman at an economic disadvantage. It takes no account of the fact that many raw materials may be depleted. Overgrazing by livestock appears to be a major factor in desertification. The overgrazing situation increases with the increase in animal population in response to water resource improvement and political and administrative arrangements. Further, as poorer lands are lost to the desert, livestock are concentrated on ever-shrinking pasture lands. Agricultural land too is encroaching upon traditional pasture. Trampling and compaction from grazing all take a heavy toll on the grasslands where large numbers of animals concentrate. Not only are the plant resources directly affected but the soil resources are deteriorated.

4.1.2 Deforestation

Devastation of forest and woodland is a serious problem in Ghana. It is a problem directly related to occupation of the land and the destruction is increasing rapidly with population growth and economic development. In part, the forests have been a source for economic development. Commercial agriculture has made rapid inroads into forest lands. Subsistence agriculture has changed the structure of forest and woodland savannas. Despite the rapid loss of forest to agriculture, cultivation is not the only cause of deforestation.

With accelerated economic development came greater demands on the forest resources. The timber industry is a major force in changing the nature of the forests. There are over 300 species of trees which produce timber in Ghana's forest; however only 25 of these were initially thought to be of commercial value. These trees were logged from the forest, thereby decreasing the species diversity. Further, mass clearing of trees to make timbering operations easier left visible scars on the landscape. The mining industry, particularly before the availability of electric power, made a considerable demand upon the forest for fuel wood. Currently the mines themselves and demarcation of concession boundaries as well as related roads and processing sites have caused destruction of large stretches of forest. It is estimated that before 1922 mining activities had stripped 350 square miles of forest. Mining activities have increased greatly since the early part of this century.

Woodcutting for domestic use constitutes a serious impact throughout the country. There are three reasons for this woodcutting: a) cutting for building material; b) cutting of foliage to feed livestock, which is particularly prevalent during times of drought; and c) the cutting of wood for fuel. By the 1960s the better quality timber in unreserved forests was near exhaustion. The closed forest zone, which before industrialization extended over 31,760 square miles in the south, had been reduced to 8,390 square miles of potentially productive forest. Currently it is possible that there are no productive forests outside of reserves. Demand projections made by the government in 1976 indicate that natural forest reserves would have to be supplemented by reforestation at the rate of 30 square miles per year for Ghana to remain self-sufficient in wood.

Forest cover is an extremely important resource. Not only does it provide economic and aesthetic benefits, but it provides wildlife habitat and other sylvan produce such as honey, fruits, nuts, beans, and medicaments. Furthermore trees, through their root-to-leaf systems, bring up nutrients from below that are released to the base-poor sandy soils through the decaying of leaves. Trees break the speed of wind and reduce the rate of evaporation at the end of the rains. They bind the soil, provide shade, store water, and encourage water percolation into the soil, thereby reducing runoff erosional flooding.

4.1.3 Water:

Water pollution is a growing threat to the environment of Ghana. In particular, industrial effluents lower water quality to the extent that treatment is necessary. But water treatment may be prohibitively expensive in an economic situation tied to subsistence agriculture. Water pollution from industrial sources is localized but expanding with the expansion of mining activities and urbanization. Industries with potential for pollution including gold, diamond, and manganese mines, breweries, tanneries, textile industry, rubber and food industries, and processing plants such as aluminum smelters.

Results of a C.S.I.R. Water Resources Research Unit survey in 1976 revealed that most factories were sited near a river and that large volumes of untreated industrial effluents were discharged, in most cases, directly into river courses. Rivers affected include the Ofin, Birim, Volta, Densu, Ankobra and some of their major tributaries. Water from diamond mines carried a particularly large sediment load as effluent. Usually the water was abstracted from the river upstream of the factory and returned to the river as effluent so that a reduced flow of river water was used as dilutant. Types of pollutants include suspended or dissolved solids, cyanide, arsenic, lime, iron, gold, quartz sand, zinc, copper, clay and laterite, oil, serum from latex, sodium, carbonate, silicate chlorine, sulphide ions, organic dye and dyestuff, pathogen dyestuff, mineral acid, starch, phenol, yeast, sugar, detergent, protein, chromium compounds, fruit and vegetable juice, and pulp. The waters may be more acid or more alkaline or of higher temperature than the original water source. Some of these pollutants are highly toxic and will change the biotic equilibrium in the water system.

Sediment loads in all streams are higher during flood season. The increase in sediment is due to erosion. The depletion of vegetative cover increases the tendency of the soil to erode so that rain washes a greater quantity of soil into the river system. In some areas agriculture is not undertaken near the river because of the presence of onchocerciasis. The reduction of that disease has opened more land to cultivation near rivers which will cause an increase in sedimentation

Lake Volta is a new and very important water resource for Ghana. It is a shallow lake filled by runoff from the entire basin. Sediment carried to the lake from rivers could hamper the normal functioning of the lake, eventually filling it in and destroying the source. The shallowness of the lake means that during the dry season the perimeter retreats dramatically. The recession of the shore creates an opportunity for farming of land with good water holding capacity. This is currently a common practice along the lake edge. Cultivation and harvest leave the soil exposed and the next year's high water will pick up a lot of the soil and carry it further into the lake. The use of fertilizers and insecticides will affect all biotic components of the lake, building an impact through time.

Plant debris left from the filling of the lake also adds to the sediment level and decay causes enrichment of the water. This coupled with fertilizer from agriculture, has caused weedy plant species to encroach on the lake. Control of the weeds and insects with herbicides and insecticides will affect the food supply of the fish, in turn affecting all species who use fish for food, including man. The weeds choking Lake Volta provide habitat for insects and molluscs which are disease vectors.

4.1.4 Health

Only 30 percent of the population has access to a safe water supply. Groundwater, which geologically should be pure and sweet, is often contaminated because of the water delivery system. Often hand dug wells are an open system whereby any contaminant on a hand may be added to the groundwater. Many communicable diseases are transmitted in this way. The development of surface water resources causes the increase of many disease vectors. Large and small irrigation systems and water conservation systems such as Lake Volta are extremely important as influences upon the spread of disease. One of the most important health problems is created by population movement from all parts of Ghana to major industrial and agricultural centers. Infected and immune persons from endemic zones move to areas of healthy individuals without the same resistances.

Water is an important limiting factor and an increase of available water habitats favors the reproduction of parasites. Damp soils increase the survival of larva of soil-transmitted helminths and the eggs of intestinal nematodes.

Lake Volta and irrigation systems have increased the breeding sites for blood-sucking and biting insects, many of which are disease vectors. Mosquito, the vector of malaria, are on the increase. Tsetse fly is also spreading, not only because of the habitat provided by the lake but because of population movements in the area. Onchocerciasis, spread by the Simulium fly, is prevalent in areas of rapids so that creation of the lake decreased the habitat of this vector. However, new habitat is created at spillways of dams and irrigation ditches. Schistosomiasis, which was previously of low importance, is now widespread in all areas of quiet water. Some of the effects of quiet water habitat from irrigation might be decreased by increasing the flow rate of water. This can be accomplished by increased gradients on canals. This would decrease the habitat for the malaria vector as well as for schistosomiasis but increase the Simulium fly habitat. Dracunculiasis or Guinea-worm disease is another disease increased by large bodies of water.

Waste pollution of the water supply is prevalent throughout Ghana. Human and animal wastes find their way into the water systems and spread contagious disease as well as vector-borne disease. Population shifts put pressure on pipe-borne water systems already in existence

increase the likelihood of contamination of open water systems. This is particularly evident in areas of quick urbanization. Bacterial and viral disease vectors are also increased by urbanization. Some industrial pollutants are extreme health hazards, such as arsenic from gold mining and noxious fumes from smelters. Surface mining provides habitat for malarial mosquitoes.

Health problems related to water are particularly prevalent throughout Ghana and they affect the majority of the population.

4.2 Remedial Measures and Government Policy^{11/}

The government of Ghana is committed to the utilization of natural resources to meet present economic needs and to prepare the ground for future social and economic development. The program of Integrated Rural/Regional Development coordinated by the government is aimed at improving institutional mechanisms to 1) improve production of small farms; 2) improve social amenities in rural areas; 3) encourage rural population participation in community development; 4) improve accessibility of consumer goods and improve the standard of living; and 5) reinforce regional planning and coordinating mechanisms. The overall goal of this development plan is to improve the quality of water, health care, and housing while increasing production of food, raw materials and exportable goods. Agriculture and industry are the prime targets for development and the major topic of scientific research. The 1977 budget expenditure for agriculture was 21.3 percent of total governmental expenditures. Because government policies and economics are currently in a state of flux it is difficult to determine the state of environmental attitudes or current projects within the governmental system.

Mechanization of agriculture has been one of the main goals of government research and development. State-directed farms designed to be a showcase of modern technologies failed to develop efficiently, thereby suggesting that perhaps the small farm is better suited to the Ghanaian situation. Per capita production on state farms is approximately 1/4 of production from the traditional sector as shown on the accompanying table. Current policy on agriculture development is not known but may well include a blending of traditional and modern agricultural methods.

11 - ^{11/} Sources: Brokensha, D. 1978.
Debelian, L. 1972.
Kaneda, H. 1973.
Tolha, H. 1979.
U.S. Agency for International Development. 1980b.
Unesco. 1966.
World Bank. 1980.

Water development plans concentrate on assuring the rural water supply together with making water available to livestock. Projects include dams, wells and the general improvement of arable land.

The dam projects were outlined previously in this report. These projects, both large and small, should be assessed for their impacts upon the environment and possible mitigation of these impacts. The structure of a dam changes the water course from a live stream with highly oxygenated water to a motionless body of water. All water parameters will change and cause changes in the living conditions for the inhabitants of the water. It is quite possible to completely eradicate some species of fish, for instance. On the other hand, fishing could become an important food item to be exploited in the reservoir behind a large dam. The construction of a dam upsets the distribution pattern of environment-related jobs. Fewer jobs in agriculture could mean more jobs in fishing. The patterns of pastoralism may also be upset. Water-borne disease parameters could also be changed.

Irrigation from small dam projects will probably have a significant effect upon agricultural production in the future. It is also possible for irrigation to increase salinization. This consequence must be monitored as it tends to be a rapid process in arid environments.

Table 6: A Comparison of State and Traditional Farm Production

	Traditional Sector	State Farm 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
Yields (tons per acre)	1.17	0.21
Production per worker (tons)	2.18	0.59

Source: Kaneda, H. 1973.

Well development has been described previously. The establishment of new wells and the upgrading of those already in existence together with the increase of piped water supply from surface as well as groundwater sources should be a positive factor in the control of communicable disease.

There is an increased awareness on the part of the government that cooking fuel needs have led to severe environmental degradation. Ghana is considering a number of actions to address environmental degradation and the rural energy shortage, focusing on specific aspects of deforestation and depletion of rural firewood supplies as well as soil erosion. Encouragement is being given to alternative forms of energy. The government has called for a national energy assessment of the entire country. The timber industry is under government regulation and attempts are being made to stop encroachment on forest reserves by agriculture. Reforestation is taking place in some areas.

Currently research is being conducted to assess air and water pollution hazards.

The Volta River Project and the construction of the Akosombo dam to produce electricity have had the effect of creating one of the world's largest lakes and displacing some 50,000 to 100,000 persons. The government of Ghana through the Volta River Authority has a highly-controlled program of colonization and development for the affected area.

Some 80,000 people from 740 scattered villages and one town, Kete-krachi, were displaced when their land was inundated. The people from many different cultures, scattered over a vast area, were regrouped in 52 new communities. Some regrouping brought together people who were traditionally less than compatible. Housing and living arrangements were unfamiliar in model towns. Farmland allocations were inadequate in new areas, as were water supplies and support for new agricultural techniques implemented by the government. Markets were disrupted. Production of agricultural commodities in all the resettled areas is reduced because of lack of land, water and or familiarity with the new area. This project is beleaguered by recurrent difficulties which are not uncommon in development projects throughout West Africa. Resettlement is still being initiated in Ghana in connection with forest and park land reserves. The work of Debelian (1972) and Brokensha (1976) outlines the causes of these problems.

The Volta River is one of the areas most affected by onchocerciasis. In 1973 the World Health Organization started a program of chemical eradication which is controlling the Simulium fly host. This control has opened the Volta River valley to development. The onchocerciasis clearing project raises its own questions with the long-term use of even low levels of insecticide. Impact on other forms of life, especially fish, may be extreme. Also, the activities of man tend to increase the range of the Simulium fly by creating new habitat which extends beyond the area of spraying. It is possible too that during the term of spraying the fly may develop a resistance to the insecticide. However, this project has been a significant advance in improving the health conditions in the Volta valley.

Greater insecticide and herbicide use has been called for in a number of government sponsored research papers. Some of the chemicals in question have not been assessed for their long-term environmental impact. Others, such as DDT, have a reported history of grave consequences. The increasing resistance of insects to chemical control has been widely reported in West Africa and throughout the world. Recommendations have been made for studies and implementation of alternate control methods.

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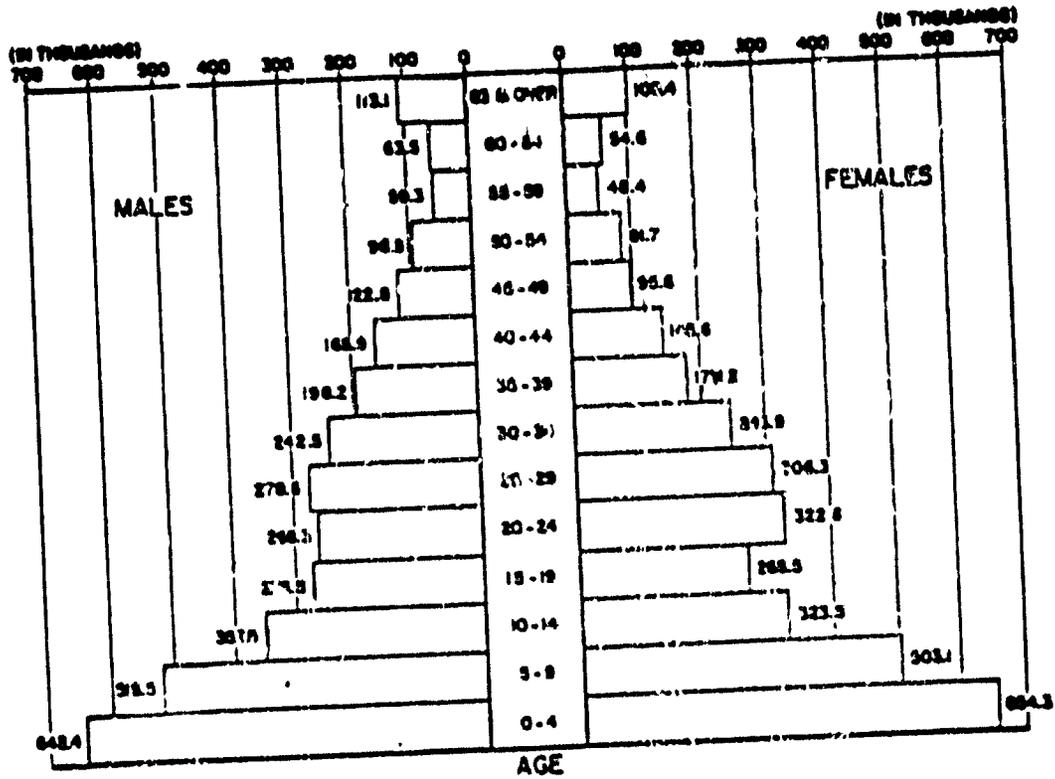
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Appendix I
Population

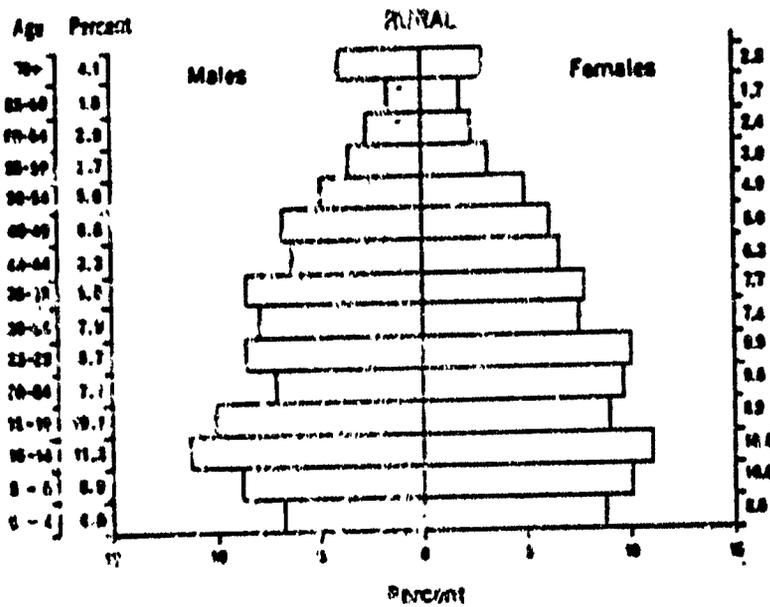
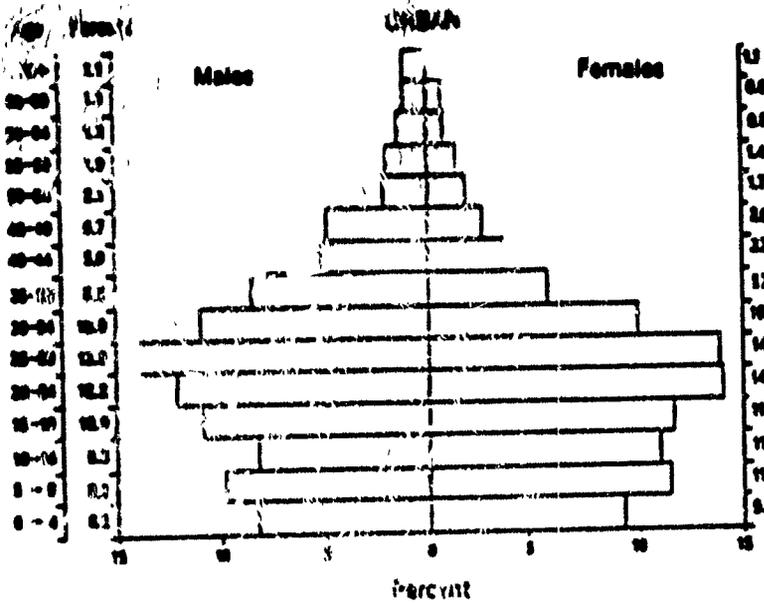
1. **Population Pyramid**
2. **Age and Sex Structure of the Population, by Rural and Urban Sectors**
3. **Ghana Demographic Statistics**
4. **Estimated Population by Category**
5. **Population by Administrative Division**
6. **Population Distribution**
7. **Ethnic Composition**
8. **Projected Rates of Growth, 1960-2000**
9. **Population Structure by Region**
10. **Health Statistics**
11. **Energy and Protein Consumption**
12. **Education Statistics**

1. Population Pyramid



Source: Kaplan I. et al. 1971.

2. Age and Sex Structure of the Population, by Rural and Urban Centers.



Source: Caldwell, J. C. Ed. 1975.

3. Ghana Demographic Statistics

<u>Total Population (1960)</u>		11,936,000
<u>Average Annual Growth Rate (1960)</u>		3.2%
<u>Age Distribution (1970)</u>		
0 - 14 years		46.9%
15 - 64 years		49.5%
65 + years		3.6%
<u>Total Area</u>		
238,538 km ² = 92,100 mi ²		
<u>Population Density</u>		
population/surface area km ² (1975)		106.0
population/arable land km ² (1970)		166.0
<u>Population</u>		
	<u>1960</u>	<u>1975</u>
% Urban	23.1	31.4
% Rural	76.9	68.6
<u>Growth Rate-Urban (1975)</u>		5.7%

Sources: U.S. Central Intelligence Agency. 1980.
U.S. AID. 1980.

4. Estimated Population by Category (in th)

	<u>1970</u>	<u>1975</u>	<u>1985</u>	Annual Growth	
				<u>1970-75</u>	<u>1975-85</u>
Ghana	8559	9779	13142	2.7%	3.0%
Urban	2474	3202	5471	5.3%	5.5%
Rural	6085	6576	7671	1.55%	1.65%
Agricultural	5000	5511	6709	2.0%	2.0%
Non-Agricultural	3559	4268	6433	3.7%	4.2%

Source: World Bank. 1978.

5. Population by Administrative Division

Administrative Division ¹	Population		Increase % (1970-1960)	Increase % (1970-1960)
	1960	1970		
Accra Capital District	491.8	848.8	72.8	8.8
Ashanti	1,109.1	1,477.4	38.2	2.4
Brong-Ahafo	867.9	782.7	10.7	2.9
Central	781.4	892.8	18.8	1.7
Eastern	1,084.2	1,582.9	18.4	1.4
Northern	531.5	728.8	37.1	3.2
Upper	787.3	867.3	13.2	1.3
Volta	777.3	947.0	21.8	2.0
Western	828.2	788.3	22.7	2.1
Total	8,728.5	8,548.6	27.0	2.4

¹ Regions except for the Accra Capital District.
² In thousands.
³ Preliminary 1970 census figures.

Source: Kaplan I. et al. 1971.

6. Population Distribution

Region	Per cent of Ghana area	Population 1970	Per cent of Ghana population	Population per sq km	Population per sq mile
Western	10.1	768 312	9.0	32	83
Central	4.0	892 593	10.4	90	234
Greater Accra	1.1	248 825	9.9	330	853
Eastern	3.4	1 262 882	14.8	63	164
Volta	3.7	947 012	11.1	26	119
Ashanti	10.5	1 477 397	17.3	61	157
Brong-Ahafo	16.2	762 673	8.9	19	50
Northern	29.4	728 572	8.5	16	27
Upper	11.4	857 295	10.0	31	81
Total Ghana	100.0	8 548 561	100.0	36	93

Source: Church, R. J. H. 1974.

7. Ethnic Composition

Ethnic Group (percent of total population)	1969	1988
Akan	44.1	43.3
Ewe	19.0	19.3
Mole-Dagbani	13.9	12.8
Go-Adangbe	6.3	9.4
Grusi	2.2	4.8
Guan	3.7	2.2
Gurma	3.5	0.7
Central Togo tribes	0.8	0.4
Non-Africans	0.2	0.2

Source: Caldwell, J. C. ed. 1979.

8. Projected Rates of Growth, 1960-2000

Period	(a) Average annual decennial rates			
	Average Rate of Growth (percent)			
	Fertility assumed unchanged		Fertility assumed to decline linearly by a total of 50% between 1975 and 2015	
	without migration	with migration	without migration	with migration
1960-1970	2.92	3.50	2.92	3.50
1970-1980	3.22	3.57	3.14	3.43
1980-1990	3.43	3.71	2.83	3.10
1990-2000	3.64	3.85	2.77	2.92

Projections	(b) Rate of population growth for various periods					
	Constant Fertility With immigration	Without immigration	Fertility Reducing by 1% per Annum With immigration	Without immigration	Fertility Reducing by 2% per Annum With immigration	Without immigration
Average annual rate of population growth (%)						
1960-5	3.8	2.3	3.8	3.3	3.8	3.3
1980-5	4.0	3.8	3.4	3.2	2.9	2.7
1985-2000	4.2	4.2	3.2	3.1	2.4	2.2

Source: Caldwell, J. C. ed. 1975.

9. Population Structure by Region

REGION	Area (Km ²)	Population 1973 (1000) ^{1/}			Percent Rural Population	No of ^{2/} Agr. Holdings 1973 (000)	Rural Population Per Km ²	Road ^{3/} Density Km/Km ²
		Total	Urban	Rural				
VOLTA	30 372	1612	172	840	83	115.5	28	0.12
EASTERN	19 712	1324	349	975	74	181.7	50	0.13
CENTRAL	9 764	941	279	662	70	88.1	68	0.22
WESTERN	23 695	825	229	596	72	76.5	25	0.11
ASHANTI	24 089	1624	512	1112	69	146.4	46	0.15
BRONG AHAFO	19 047	833	205	628	75	83.7	16	0.09
NORTHERN	69 079	803	185	618	77	59.8	9	0.05
UPPER	27 092	901	73	828	92	106.0	31	0.09
GREATER ACCRA	2 547	1009	884	125	13	45.1	58	0.26
TOTAL	215 397	9272	2888	6384	69	902.8	27	1.19

- ^{1/} Population Census 1960 and 1970
^{2/} Ghana Sample Survey of Agriculture 1970
^{3/} Ghana Highway Authority -- Road Inventory Summaries.

10. Health Statistics

	<u>1960</u>	<u>1970</u>	<u>1973</u>	<u>1975</u>
Life expectancy years	36.5	41.8		43.5
Birth rate/1000 (5 year period)	50.6	49.5		48.8
Infant mortality/1000 live births	156.0	156.0		
Death rate/1000	24.0	10.0		
Population/physician	21,000	12,950	9,840	10,510
Population/nursing person	2,740	1,070	1,090	1,430
Population total/hospital bed	1,050	760	700	600
Population rural/hospital bed			870	718
Population urban/hospital bed			490	444
Average caloric intake as % of requirement (FAO)	89	96	99	
Population with access to safe water				
total		35		35
urban		86		86
rural		14		14
Major causes of disease (1975)				measles, whooping cough, childhood disenta
Major causes of death (1975)				hepatitis, measles, typhoid fever

Sources: Legum. 1980.
U.S. AID. 1980a.

11. Energy and Protein Consumption

	<u>Energy Food</u> <u>% of Need Met</u>	<u>Protein Food</u> <u>% of Need Met</u>	<u>Animal Protein Food</u> <u>% of Target Met</u>
National Average	82	119	n.a.
Northern Zone	79	156	37
Southern Zone			
A. Forest	81	119	120
Coastal Plain	69	93	79
B. Rural	77	110	102
Urban	76	139	170

Source: World Bank. 1978.

12. Education Statistics

	<u>1960</u>	<u>1962</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Primary school enrollment % population ages 5 - 11 years	59		61	55	
Secondary school enrollment % population aged 12 - 17 years	3		11	10	
Primary pupils/teacher	31		30	29	
Secondary pupils/teacher			17	17	
Adult literacy rate %					
male		29	43		
female		10	18		
total		19	30		30

Source: U.S. AID. 1980a.
U.S. Department of State. 1978.

Appendix II

Economics

1. General Economic Statistics
2. Employment by Sector
3. Economic Activity by Sex
4. Poverty Statistics
5. Cost of Living
6. Land Use
7. Agricultural Characteristics of Regions
8. Livestock Distribution by Region
9. Principal Crops
10. Forestry
11. Fishing
12. Mining
13. Industry

1. General Economic Statistics

Gross National Product (US \$ 1977)	4,000,000,000
Per Capita GNP (US \$ 1977)	380
Per Capita GNP Growth Rate (1960-77)	0.30
Per Capita Agricultural Production Growth Rate (1970-78)	2.00
Total Labor Force (1970)	3,300,000
Women (1975)	41.60
Men (1975)	58.40
Labor Force as % of Total Population (1975)	37.60
Agriculture Percent of Total Labor Force (1970)	58.40
Agriculture Percent of Total Labor Force (1977)	54.00
% Labor Force Unemployed (1970)	6.20

Source: U.S. AID. 1980a.

2. Employment by Sector

	1968	1969	1970	1971
Agriculture, forestry and fishing	47,530	46,316	48,929	45,669
Mining and quarrying	29,230	25,933	25,248	24,144
Manufacturing	44,713	52,374	52,783	50,662
Construction	34,783	37,467	49,993	44,320
Electricity, water and sanitary services	16,023	17,642	14,780	16,310
Commerce	28,913	35,930	33,729	35,731
Transport, storage and communications	30,374	30,371	32,343	32,069
Services	228,347	234,339	237,761	246,411
	391,301	400,814	397,968	401,367

Source: Europa Publications. 1980a.

3. Economic Activity by Sex

	Employed		Unemployed		Homemakers		Students		Aged & Disabled		Other	
	1960	1968	1960	1968	1960	1968	1960	1968	1960	1968	1960	1968
Males	83.2	78.4	3.8	3.9	0.6	3.4	6.0	11.6	3.3	2.0	1.1	0.4
Females	33.6	73.5	3.0	1.6	26.7	16.7	1.8	4.9	6.8	2.6	0.3	0.3
Both sexes	68.6	75.8	4.4	2.7	18.4	10.4	2.9	8.1	4.0	2.3	0.7	0.3

Source: Caldwell, J. C. ed. 1975.

4. Poverty Statistics

Per Capita GNP (US \$ 1977)	100
Poverty = that income level below which a minimal nutritionally adequate diet plus essential non-food requirements is not affordable	
Poverty Income Level	70
Rural (US \$ 1975)	NA
Urban (US \$ 1975)	NA
Population Below Poverty Level (1975)	25
Rural	16
Urban	16
Population Access to Excreta Disposal (1975)	40
Rural	95
Urban	56
Total	56
Population Access to Safe Water (1975)	14
Rural	86
Urban	35
Total	35

Source: U.S. AID. 1980a.

5. Cost of Living

(Consumer Price Index for Accra. Average of monthly figures; base: 1970=100)

	1968	1969	1971	1972	1973	1974	1975	1976
Food	88.2	93.3	106.2	113.9	141.9	164.7	212.4	414.1
Food and light	96.3	99.4	96.0	111.3	127.6	170.9	137.8	293.7
Clothing	100.4	101.6	107.4	111.8	127.1	160.4	224.3	383.2
Rent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ALL ITEMS	91.9	96.4	104.9	114.8	127.9	163.3	210.3	331.3

August 1977: Food 99.9. All items 69.9.

Source: Europa Publications. 1980.

6. Land Use (1970)

	1000 ha	%
Total geographical area	23270	100
Total land area	21383	92
Reserved forest	2436	10
Unreserved forest	5423	24
Total area cultivated	2582	11
of which food crops	1117	5
Bush fallow	12202	53
Ratio bush fallow/ Cultivated food crop	11:1	

Source: World Bank. 1978.

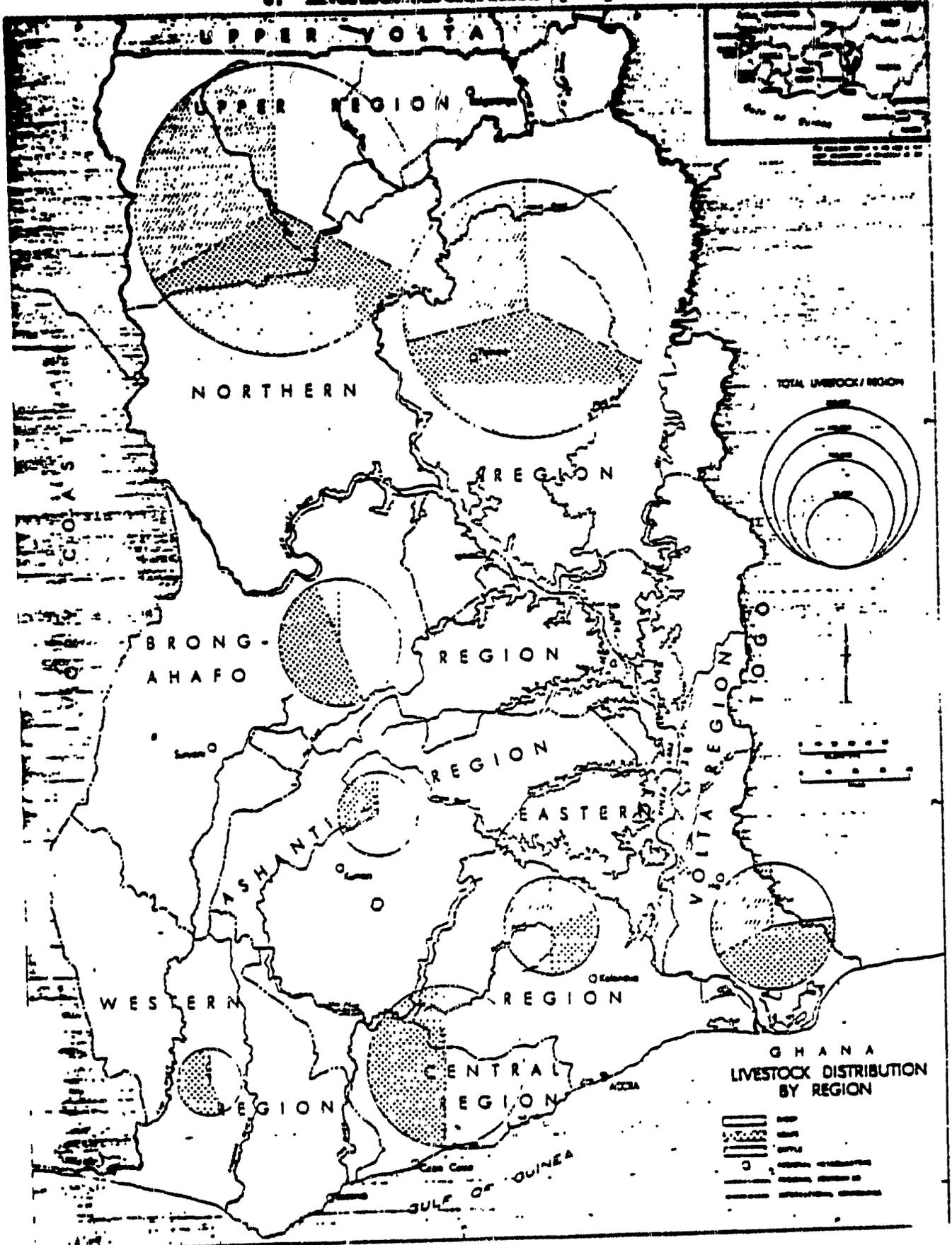
7. Agricultural Characteristics of Regions

REGION	Cultivated Area (1970) Per Household					Cultivated Area Per Holding		
	Total 000 ha	Tree Crops %	Food Crops %	Persons N°	Labor Units N°	Total ha	Per Fam. Memb. ha	Per Labor Unit ha
VOLTA	239	51	49	4.0	2.8	.9	.2	.3
EASTERN	312	69	31	3.8	2.7	1.2	.3	.4
CENTRAL	158	67	33	3.9	2.7	1.-	.2	.4
WESTERN	243	78	22	4.3	3.2	2.-	.5	.8
ASHANTI	595	78	22	4.4	3.0	1.8	.4	.6
BROUG ALAFO	506	72	28	4.7	3.2	2.2	.4	.7
NORTHERN	137	-	100	5.4	3.7	1.7	.3	.4
UPPER	348	-	100	5.2	3.4	1.7	.3	.5
GREATER ACCRA	45	9	91	. 1/	. 1/	. 1/	. 1/	. 1/
TOTAL	2583	57	43	4.4	3.1	1.6	.4	.5

1. Greater Accra included in Eastern Region.

Source: World Bank. 1978.

8. Livestock Distribution by Region



Source: World Bank. 1978.

9. Principal Crops

(*000 metric tons)

	1975	1976	1977
Maise	343	240	306
Millet	133	70†	70†
Sorghum	133	81†	80†
Rice (paddy)	71	60	70
Sugar cane	196*	200*	200*
Cassava (manioc)	2,398	2,500	2,500
Other roots and tubers	1,810	1,930	1,930
Onions	20*	20*	19*
Tomatoes	90	97†	100†
Eggplants (aubergines)	28	27*	26*
Pulses	17	12*	8*
Oranges	150	145*	140*
Lemons and limes	31*	30*	25*
Bananas	7	8†	9*
Pineapples	16	27†	28*
Palm kernels	34*	32†	30*
Groundnuts (in shell)	111	60†	73*
Coconuts	311	300*	304*
Copra	17*	17*	17*
Coffee (green)	4*	4*	4*
Cocoa beans	396	320†	310†
Tobacco (leaves)	2	2†	1†

* FAO estimate.

† Unofficial figures.

Source: Europa Publications. 1980.

10. Forestry

(*000 cubic metres, all non-coniferous)

ROUNDWOOD REMOVALS				SAWNWOOD PRODUCTION			
	1974	1975	1976		1974	1975	1976
Sawlogs, veneer logs and logs for sleepers	1,439	1,332	2,138	Sawnwood (incl. boxboards)	453	398	316
Pitprops (mine timber)	16	13	13	Railway sleepers	4	5	65
Other industrial wood	376	363*	363*	TOTAL	457	403	381
Fuel wood	10,108	10,823	10,539				
TOTAL	11,949	12,531	13,058				

*FAO estimate.

Source: Europa Publications. 1980a.

11. Fishing

(*000 metric tons, live weight)

	1974	1975	1976
Inland waters	17.3	41.9	41.9*
Atlantic Ocean	182.2	212.6	195.8
TOTAL CATCH	219.5	254.5	237.7

* FAO estimate.

Source: Europa Publications. 1980a.

12. Mining

	1974	1975	1976
Gold ('000 fine oz. troy)	614	516	532
Diamonds ('000 carats)	2,372	2,323	2,300
Manganese ('000 tons)	254	393*	312
Bauxite ('000 tons)	357	325	267

* Figure covers 11 months only.

Source: Europa Publication. 1980a.

13. Industry

SELECTED PRODUCTS

		1973	1974	1975	1976
Wheat flour	'000 metric tons	87	71	52	n.a.
Raw sugar	" " "	10	5	8	12
Beer	'000 hectolitres	676	765	500	n.a.
Cigarettes	millions	2,259	2,232	2,330	n.a.
Motor spirit (petrol)	'000 metric tons	199	231*	224*	224*
Kerosene	" " "	96	96*	90*	90*
Distillate fuel oils	" " "	261	329*	319*	319*
Residual fuel oil	" " "	350	394*	413*	413*
Cement	" " "	374	321	688	700*
Aluminium (unwrought)	" " "	152.2	157.2	143.2	146.6
Television receivers	'000	2	2	2	n.a.
Electric energy	million kWh	3,899	3,945*	3,996	4,226

* Provisional.

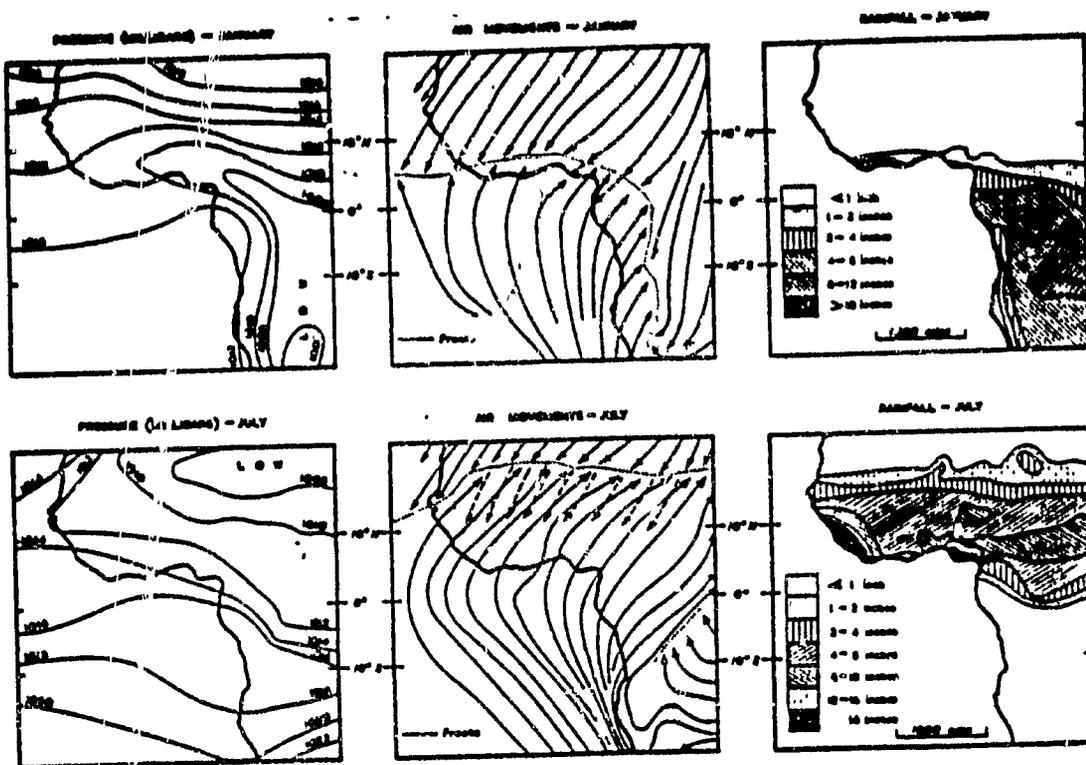
Source: Europa Publications. 1980a.

Appendix III

Climate

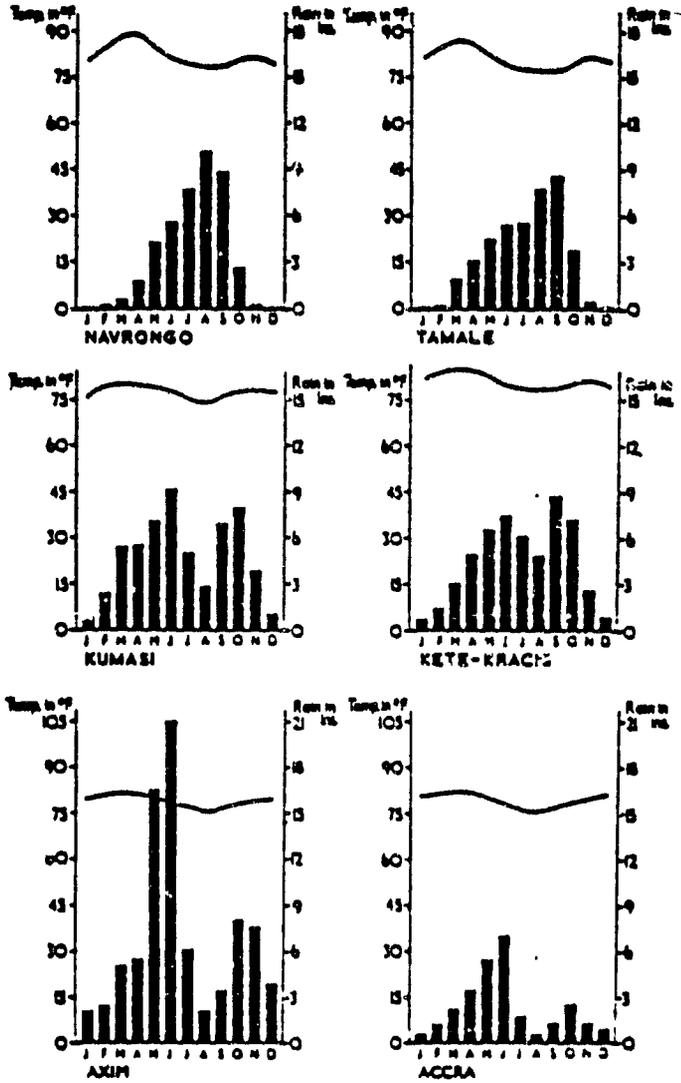
1. Weather Systems
2. Mean Monthly Distribution of Temperature and Rainfall at Selected Stations
3. Annual Mean Rainfall

1. Weather Systems Which Influence the Major Climatic Patterns of Ghana
January and July



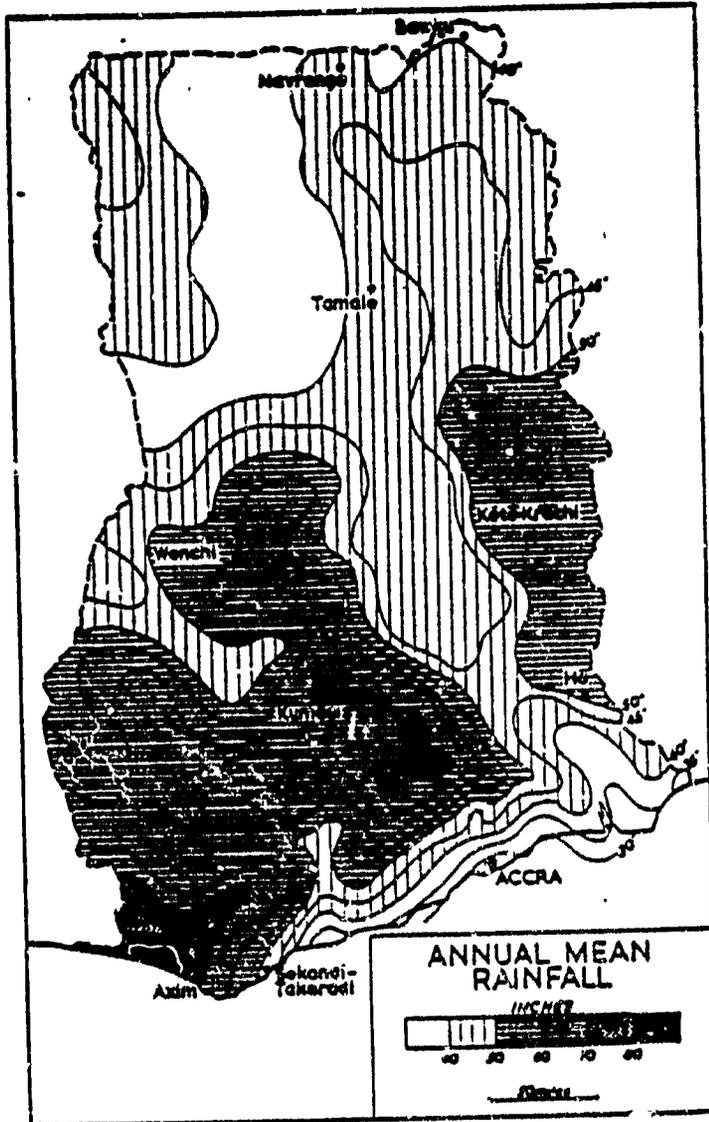
Source: Boateng, E. A. 1966.

2. Mean monthly Distribution of Temperature and Rainfall at Selected Stations



Source: Boateng, E. A. 1966.

3. Mean Annual Rainfall



Source: Boateng, E. A. 1966.

Appendix IV

Environmental Legislation

1. General
2. Air
3. Water
4. Fauna
5. Flora
6. Land Use and Soil Conservation
7. Non-renewable Resources and Hazardous Substances

Sources: Johnson, H. and J. Johnson. 1977.
U.S. Environmental Protection Agency. 1976.

1. General

Decree N.R.C.D. 239 of 1974 establishes the Environmental Protection Council, which is responsible for advising the government on all matters related to the environment. Charged with maintaining a sound ecological balance, this council coordinates environmental activities and education, conducts research, and safeguards the environment during the planning and execution of all development projects.

2. Air

No legislation on air quality or pollution in Ghana is reported in the international literature. Air pollution from mining and smelting processes is noted as a serious threat to plant, animal, and human life.

3. Water

Act 310 of 1965 establishes the Ghana Water and Sewage Corporation. This corporation regulated distribution and conservation of water resources. It also operates and supervises the sewage systems, establishes standards concerning water supply and sewage disposal, and issues regulations to prevent water pollution.

4. Fauna

Act 43 of 1961, the Wild Animals Preservation Act, consolidates and amends the law regulating wild animals, birds and fish, game officers, export and import of trophies, hunting seasons and methods and protection of various species.

Regulation (L. I. 685) of 1971, the Wildlife Conservation Regulation, increases the list of animals under complete protection and regulates export, hunting and hunting licenses.

Act 155 of 1963, the Fisheries Act, amends the Fisheries Ordinance Chapter 169 of 1946. It regulates motor fishing vessels, methods of fishing, and prescribes limits of fish type and the size and mesh of nets.

Decree (N.R.C.D. 72) of 1972, the Fisheries Decree, regulates fishing in general.

5. Flora

Ordinance 12 of 1927, the Forestry Ordinance, is revised (Chapter 157 of 1954) and amended (act 10 of 1957). The ordinance protects forests and assigns and protects forest reserves.

Ordinance 20 of 1949, the Trees and Timber Ordinance, and the Control & Cutting Regulations of 1958 protect and prohibit the dealing in timber from undersized trees.

Act (No. 12/60) of 1960 is the Forest Improvement Fund Act.

Act (No. 124/62) of 1962 is the Concessions Act.

Act 307 of 1965 is the Prevention and Control of Pests and Diseases of Plants Act.

Decree (N.R.C.D. 237) of 1974 is the Trees and Timber Decree.

Decree (N.R.C.D. 247) is the Forest Protection Decree.

6. Land Use and Soil Conservation

Ordinance (Cap. 84) of 1945 (amended 1958, 1960), the Town and Country Planning Ordinance, is a physical planning decree.

Ordinance 32 of 1953, the Land Planning and Soil Conservation Ordinance, establishes committees to preserve and reclaim land, protect water resources, prevent soil erosion, and utilize swamp lands. This ordinance regulates the breaking and clearing of land, grazing and watering livestock, afforestation and reforestation, and water resource development.

Act 35 of 1957 amends the Land Planning and Soil Conservation Ordinance.

7. Non-Renewable Resources and Hazardous Substances

Act 46 of 1961, the Volta River Development Act, establishes an authority which has the duties of generating and supplying electricity from the Volta River Dam and Power Station. This authority is also responsible for the creation of the lake, administration of adjacent land, and the resettlement of people.

Act 64 of 1961, the Pharmacy and Drug Act, seeks to control distribution, use, etc., of dangerous drugs.

Act 204 of 1963, the Atomic Energy Act, sets up a commission which maintains relations with international organizations, promotes research, education, exploration for radioactive minerals, and the use of radio isotopes. It

regulates construction of atomic facilities, safety measures and waste disposal.

Act 235 of 1964, the Oil in Navigable Waters Act, ratifies the International Convention for Prevention of Pollution of the Sea by Oil (1954). It prohibits the discharge of oil and establishes penalties.

Act 276 of 1965 is the Mines and Mineral Conservation and Development Act.

Decree 228 of 1968 is the Minerals Act.

Regulation L.O. 237, the Minerals (Off-shore) Regulation, relates to licenses for off shore mineral development and the prohibition of pollution and environmental degradation.

Appendix V

Government Structure

Legislative

National Assembly (Parliament)
speaker (elected by
Members)

Executive

President

Commission for Information and Cocoa Affairs

Commission for Economic Planning, Finance, Trade
and Tourism

Commission for Lands, Natural Resources, Fuel and
Power

Commission for Transport, Communications, Works
and Housing

Commission for Consumer Affairs and Co-operatives

Commission for Agriculture

Commission for Sports and Local Government

Commission for Education, Culture and Health

Commission for Justice and Internal Affairs and
Attorney General

Judiciary

Supreme Court

High Court
(Judicial Divisions
are on a geographic
basis)

Magistrates Court

Note: The information for this governmental structure diagram cannot be considered current due to fluctuations in government in the last year including scheduled general elections.

Sources: Europa Publications, 1980a.
Price, J. H. 1967.
U.S. Central Intelligence Agency. 1980.

Appendix VI

Organizations with Environmental Interests/Responsibilities

1. International Organizations
2. Governmental Organizations
3. Non-governmental Organizations
4. Universities

Source: Bergquist, W. E. 1978.
Europa Publications. 1980a.
Europa Publications. 1980b.
Food and Agricultural Organization Current Agricultural Research
Information System (CARIS). 1978.
Paylore, P. 1977.
Sierra Club. 1976.
U.N. Economic Commission for Africa. 1972.
U.N. Environmental Programme. 1979.

1. International Organizations

African Association of Cartography Algiers, Algeria

Purpose: to encourage the development of cartography, organize conferences and other meetings, promote establishment of training institutions.

African Civil Aviation Commission (AFCAC) P.O.B. 2356 Dakar, Senegal

Purpose: to provide a framework for co-ordination and co-operation in all civil aviation activities.

African Development Bank (ADB)

Purpose: development of projects and program financing.

African Inter-Ministerial Committee on Food

Purpose: assist in implementing the decisions of the 1974 World Food Conference.

African Regional Standards Organization (ARSO) Accra, Ghana

Purpose: promote standardization in the continent, to influence the policies of the International Organization for Standardization (ISO) and to draft regional standards.

African Timber Organization B.P. 1077 Libreville, Gabon

Purpose: to enable members to study and co-ordinate ways of influencing prices of wood and wood products by ensuring a continuous flow of information on forestry matters; to harmonise commercial policies and carry out industrial and technical research.

African Training and Research Center in Administration and Development (CAFRAD)

Purpose: Social and Economic Development in Africa

African Union of Railways

B.P. 687
Kinshasa, Zaire

Purpose: to standardize, expand, co-ordinate and improve member railway services.

Association for the Taxonomic Study of Tropical African Flora (Association pour l'etude taxonomique de la flore d'Afrique tropicale - AETFAT)

Laboratorio de Botanica
Excmo. Cabildo Insular
Las Palmas de Gran Canaria
Canary Islands, Spain

Association of African Geological Surveys (Association des services geologiques africains)

60 Blvd. Saint-Michel
75272 Paris
Cedex 06, France

Purpose: synthesis of the geological knowledge of Africa and neighbouring countries; encouragement of research in geological and allied sciences for the benefit of Africa; dissemination of scientific knowledge.

Association of African Trade Promotion Organizations (AATOP)

P.O.B. 23
Tangier, Morocco

Cocoa Producers' Alliance

P.O.B. 1718
Western House
8-10 Broad St.
Lagos, Nigeria

Purpose: exchange scientific and technical information; to discuss problems of mutual concern to producers; to ensure adequate supplies at remunerative prices.

Economic Community of West African States - ECOWA

European Economic Community

Inter-African Committee for Hydraulic Studies (CIAH)

Purpose: Conduct hydraulic surveys, research and information exchange.

International Coffee Organization (ICO)

Purpose: to create balance of supply and demand and development of productive resources.

Organisation Internationale Contre le Criquet Migrateur Africain (OICMA)

Purpose: control of and related research on the African migratory locust.

Organization of African Unity - OAU

United Nations and affiliate organizations

**West African Clearing House
Freetown, Sierra Leone**

Purpose. promote local trade and currency transactions.

West African Regional Group

Purpose: industry, agriculture, transport communications, energy, trade education, research, training, health and the movement of workers.

**West African Rice Development Association
P.O.B. 1919
Monrovia, Liberia**

Purpose: an intergovernmental organisation to make West Africa self-sufficient in rice; has regional research programme, assists in rural development projects and operates regional training centre.

2. Governmental Organisations

Aiyinase Agricultural Experiment Station (CSIR)
Agricultural Experimental Station
P.O. Box 10 Aiyinase
Nsima
Tel. Aiyinase 15
Cable: CROPTECH.

General fields of activity: rubber agronomy, coconut agronomy, oil palm agronomy, production of oil palm seeds.

Animal Research Institute (CSIR)
P.O. Box 20
Achimota
Cable: Animres Achimota

Library and documentation: 500 volumes and 150 journals.

General fields of activity: animal husbandry and nutrition, animal health and disease prevention, farm management and farm economics, animal breeding.

Atomic Energy Commission

Buildings and Roads Research Institute (CSIR)
P.O. Box 40
University Post Office
Kumasi

Crops Research Institute of Ghana (CSIR)
P.O. Box 3785
Kumasi
Tel. 6221, 6222
Cable: CROPSEARCH

The Crop Research Institute of Ghana is the superior institute for agricultural experimental stations and crop-specific research organizations.

Council for Scientific and Industrial Research (CSIR)
P.O. Box N. 32
Accra
Tel. 77651
Telex: SCIENSCIM

The council has the overall responsibility for research organization in Ghana. It encourages research, initiates new projects, coordinates research and disseminates information. It is regarded as scientific research arm of the government and undertakes research on problems referred to it by various ministries and industries which do not have their own research facilities. Those organizations with CSIR affiliation are noted.

Ejura Field Station (CSIR)

Environmental Protection Council
Parliament House
Accra

Charged with maintaining a sound ecological balance, this council coordinates environmental activities and education, conducts research and safeguards the environment during the planning and execution of all development projects.

Food Research Institute (CSIR)

P.O. Box M-20
Accra
Tel. 77330, 77647
Cable: FOODSEARCH

Library and documentation: 2,646 books, 99 periodicals, 1,900 other publications, 5 local newspapers, 2,047 bound volumes of periodicals.

General Fields of activity: engineering, processing, chemistry, microbiology and nutrition.

Food Storage Section - Pokoase (CSIR)

Private bag
Pokoase
Cable: CROPTECH POKOASE

General fields of activity: storage of durable agricultural food products, especially solution of the problems associated with the storage of cereals and grain legumes at the farmer and small trader levels.

Forest and Forest Products Research Institute (CSIR)

University P.O. Box 63 UST
Kumasi
Tel. 5873
Cable: FORSEARCH

Library and documentation: 2,400 volumes, 2,000 pamphlets, subscribes to 88 journals, receives 40 journals in exchange.

General fields of activity: silviculture and management, tree breeding and forest genetics, forest entomology, forest economics, wood seasoning and preservation, forest pathology, wood anatomy, timber engineering and utilization.

Geological Survey of Ghana
P.O. Box M 80
Accra

Ghana Meteorological Services Department
P.O.B. 87
Lagon

Industrial Research Institute (CSIR)
P.O. Box M 32
Accra

Institute of Aquatic Biology
P.O. Box 38
Achimota
Tel. 75511
Cable: AQUABI - GHANA

Library and documentation: 550 volumes, 90 journals, and 72 technical reports and reprints.

General fields of activity: general research in freshwater biology, physical and chemical limnology of rivers, lakes, lagoons and estuaries, pollution studies and monitoring of inland waters with a view to control, freshwater fishery and aquaculture, study and control of aquatic weeds and of vectors of waterborne diseases.

Kpong Agricultural Irrigation Station (CSIR)

Kwadaso Agricultural Experiment Station (CSIR)
P.O. Box 3785
Kumasi
Tel. 6221-2
Cable: CROPSEARCH - KUMASI

Library and documentation: 2,700 books, 200 titles of periodicals.

General fields of activity: agronomy, weed control, horticulture, plant physiology, soil management, plant breeding.

Marine Fisheries Research Unit

Meteorological Department
Accra

Ministry of Agriculture
P.O. Box 630
Accra

Division of Agriculture
P.O. Box 299
Accra
Tel. Add.: AGRESTIC-ACCRA

Orients fundamental research, applied research, and technological research.

Branch of Soil and Land-Use Survey
P.O. Box 1433
Kumasi

Division of Animal Health
P. O. Box M 37
Ministry Branch Post Office
Accra
Tel. Add.: CHIEFVET-ACCRA

Division of Fisheries
Accra

Ministry of Health
P.O. Box 300
Accra, Ghana

Ministry of Industries
P.O. Box M 39
Accra

Ministry of Lands and Mineral Resources
P.O. Box M-212
Accra

Department of Forestry
P.O. Box 527
Accra

Department of Game and Wildlife
P.O. Box M-239
Accra

Ministry of Local Government
Department of Parks and Gardens
Accra

manages botanical gardens and city and town gardens and parks

Nsawam Cannery Division (Pineapple plantation) (CSIR)

Nyankpala Agricultural Experiment Station (CSIR)
P.O. Box 52
Nyankpala Via Tamale
Tel. Tamale 2411
Cable: CROPTECH-TAMALE

General fields of activity: varietal improvement, fertility studies, pest and disease control on rice, sorghum, millet, groundnuts and fibre crops

Ohawu Agricultural Experiment Station (CSIR)
P.O. Box 24 Chawu/Abor
Cable: CROPTECH - ABOR

General fields of activity: agronomic research into food-crop production, research into breeding and production of industrial crops (bast fibre etc.), soil conservation, control of runoff

Oil Palm Research Centre/Kusi (CSIR)
P.O. Box 74
Tel. Kusi 2
Cable: CROPTECH-Kade

General fields of activity: plant breeding, herbicide investigation, agronomy, seed production and germination.

Plant Introduction and Exploration Section (CSIR)
Crops Research Institute
Bunso-Bosuse
Tel. 2 Bunso
Cable: CROPTCR-BUNSO

General fields of activity: collection of germplasm of various crops, production of oil palm seeds.

Soil Research Institute (CSIR)
Academy Post Office
Kwadaso-Kumasi
Tel. 2353, 2254 Kumasi
Cable: CHIEFSOIL KUMASI GHANA

Library and documentation: 1,200 books and pamphlets, 207 journals and annuals

General fields of activity: soil genesis survey and classification, soil chemistry and mineralogy, soil fertility, soil conservation and erosion control, soil microbiology, soil physics.

Volta River Authority
P.O. Box 88
Akonsombo

Water Resources Research Unit (CSIR)
P.O. Box M 32
Accra

3. Non-governmental Organizations

Agricultural Engineers Limited
P.O. Box 3707
Accra

designs and produces small-scale oil processing equipment and modern animal drawn equipment

Agronomy Research Station (GAS Ag. Res. Inst.)
Bunso

Catholic Relief Services

Centre for Research into Plant Medicine
Mampong Akwapim Community Centre
Mampong Akwapim

researches and tests medicinal plants

Cocoa Research Institute (CRIG) (GSA)
P.O. Box 8, Tafo.
Tel. Add.: DIRESCAG-TAFO

agronomy, breeding, entomology, pathology, soil science and chemistry, plant physiology; library of 5,000 volumes

coordinates activities of all bodies concerned with environmental matters in Ghana, serves a channel of communication between these bodies and the government, promotes research and educational programs

Evangelical Presbyterian Church
P.O. Box 224
Ho, Volta Region

Food Preservation Research Unit (GAS)

Ghana Academy of Sciences
P.O. Box M-32
Accra

responsible for programs of the Scientific Committee on Problems of the Environment (SCOPE) and Man and Biosphere (MAB) in Ghana; monitors water quality; Ghana Academy of Science is the supervisory for a number of affiliated institutes as noted (GAS)

Ghanaian-German Agricultural Development Project
P.O. Box 171
Tamale

produces animal drawn equipment, works to popularize the equipment and bullock training

Ghana Rural Reconstruction Movement
Yensi Centre
Box 14
Mampong-Akwapa

voluntary group with an interest in appropriate technology applications for rural development

Ghana Wildlife Society
P.O. Box 1148
Kumasi

**Institute of Tropical Medicine and Endemic Diseases
Entomological and Parasitological Research Unit
Mampong-Akwapim**

**Medical Research Institute
P.O. Box 300
Accra**

**National Institute of Health and Medical Research (GAS)
P.O. Box 2848
Accra**

**Operation Help Nima
P.O. Box 37
Nima**

**undertakes research on housing design and low-cost construction techniques
and technology**

**Radio-isotope and Health Physics Unit (GAS)
Physics Department, University of Ghana
P.O. Box 25
Legon**

**Soil Research Unit (GAS)
P.O. Box 1433
Kumasi**

**Technology Consultancy Centre
Kumasi**

**Working Group on the Environment
c/o Institute of Aquatic Biology
P.O. Box 28
Achimota**

Non Governmental Agencies and Assistance Activities

This chart provides a quick reference summary of the development assistance activities of the organizations included in this report. "PP" indicates a proposed program, a dot indicates a current program.

AGENCIES	Communications	Community Development	Construction, Housing & Planning	Cooperatives, Credit Unions & Loans	Economic & Development Planning	Education	Equipment & Material Aid	Food Production & Agriculture	Industrial Development	Medicine & Public Health	Nutrition	Population & Family Services	Public & Business Administration	Social Welfare	Women	Youth
AFL-CIO African-American Labor Center			●			●				●			●			
The African-American Institute						●										
Agricultural Missions Foundation							●									
American National Red Cross							●									
Assemblies of God										●						
Carnegie Corporation of New York	●					●										
Catholic Medical Mission Board							●			●						
Catholic Relief Services		●				●	●	●		●						
Christian Nationals' Evangelism Commission						●				●				●		
Church World Service		●						●								
Credit Union National Association				●												
Darwin Book Aid Plan						●	●									
Direct Relief Foundation							●			●						
Divine Word Missionaries						●				●						
Education Development Center						●										
The English-Speaking Union of the United States						●	●									

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This chart provides a quick reference summary of the development assistance activities of the organizations included in this report. "PP" indicates a proposed program, a dot indicates a current program.

AGENCIES	Communications	Community Development	Construction, Housing & Planning	Coop. L.	Economic & Development Planning	Education	Equipment & Material Aid	Food Production & Agriculture	Industrial Development	Medicine & Public Health	Nutrition	Population & Family Services	Public & Business Administration	Social Welfare	Women	Youth
	The Ford Foundation			•		•	•							•		
Society of the Holy Child Jesus New York Province	•		•			•		•	•	•	•			•		
Holy Cross Missions (Holy Cross Foreign Mission Society)						•							•			
International Executive Service Corps										•						
International Institute of Rural Reconstruction		•	•		•			•		•	•			•		
Kaiser Foundation International										•						
NAP International							•			•						
Medical Mission Sisters		•	PP	PP		•		•		•	•			•		
Mennonite Board of Missions																
Mennonite Economic Development Association				•					•							
Missionary Sisters, Servants of the Holy Spirit						•	•			•				•		
New Eyes for Needy		•								•						
Operation Crossroads Africa								•		•						
Opportunities Industrialization Centers International		•					•									
Oxfam-America				PP				•								
Planned Parenthood Federation of America												•				

- continued -

This chart provides a quick reference summary of the development assistance activities of the organizations included in this report. "PP" indicates a proposed program, a dot indicates a current program.

AGENCIES	Communications	Community Development	Construction, Housing & Planning	Cooperatives, Credit Unions & Loans	Economic & Development Planning	Education	Equipment & Material Aid	Food Production & Agriculture	Industrial Development	Medicine & Public Health	Nutrition	Population & Family Services	Public & Business Administration	Social Welfare	Women	Youth
	Population Services International												•	•		
Public Administration Service						•										
The Salvation Army						•	•			•				•		
Seventh-Day Adventist World Service						•										
Southern Baptist Convention, Foreign Mission Board								•		•				•		
Summer Institute of Linguistics						•		•		•						
Technoserve								•	•				•			
United Methodist Church						•										
Wheat Ridge Foundation										•				•		
White Fathers of Africa						•	•	•		•						
World Education		•				•								•		
World Neighbors										•	•	•		•		
World Rehabilitation Fund							•			•				•		
World University Service U.S. Committee										•						
Young Men's Christian Association of the United States		•				•		•								•
Young Women's Christian Association of the U.S.A.		•	PP			•					PP			•	•	•

Source: Technical Assistance Information Clearinghouse, 1976.

4. Universities

University of Ghana
P.O. Box 25
Legon, NE, Accra

attached research institutions and facilities:

Agricultural Research Station - Legon
University of Ghana
P.O. Box 38
Legon

Agricultural Research Station - Kade
P.O. Box 43
Kade

Ghana Geographical Association
University of Ghana
Legon

Survey Division
P.O. Box 191
Cantonments
Accra

Institute of Statistics
Box 74
Legon, Accra

Kpong Agricultural Irrigation Research Station
P.O. Box 9
Kpong

soil management, hydrology, crop production, crop protection,
forestry, animal production, animal health

Regional Institute for Population Studies
P.O. Box 96
Legon

**Volta Basin Research Project Unit
P.O. Box 55 Lagon
Lagon, Accra**

**University of Science and Technology
University Post Office
Kumasi**

attached research facilities and institutions:

**Centre for Research and Development in Housing, Planning and
Building
Faculty of Architecture
University of Science and Technology
Kumasi**

**involved in urban and rural housing development; develops alter-
native materials and components, tools and techniques; interested
in timber utilization; disseminates information**

**Forest Products Research Institute
University of Science and Technology
Kumasi**

**Technology Consultancy Centre
University of Science and Technology
University Post Office
Kumasi**

**performs a number of inter-related functions directed primarily
towards local craftsmen, entrepreneurs and small-scale indus-
tries: (a) it provides technical and commercial consulting
services for small-scale industries and government agencies
and departments; (b) develops and tests new products and pro-
cesses; (c) implements pilot production units to prove new
processes**

**University of Cape Coast
Cape Coast**

Colleges

Accra Polytechnic
P.O. B. 561
Accra

Accra Technical Training Centre
P.O. Box M. 177
Accra

attached to Ministry of Education to train tradesmen for industry and
civil service

Government Technical Institute
P.O.B. 206
Sunyani

Ho Technical Institute
217 Ho
Volta Region

Takoradi Polytechnic
P.O. Box 256
Takoradi

Tamale Technical Institute
P.O. Box 67
Tamale

Koforidu Technical Institute
P.O.B. 123
Koforidua

Kpandu Technical Institute
P.O. Box 76
Kpandu, Volta Region

1957
National Film and Television Institute
P.O.S. 1613
Acara

Appendix VII

Dams Existing and Under Study

Dams Existing and Under Study

NAME	Akasambo	Kpong	Bui
STATUS	Built	Under Construction Ready 1981.	Under study
PURPOSE	Hydroelectric	Hydroelectric	Hydroelectric
LOCALITY			
Basin	Volta	Volta	Volta
River	Volta	Volta	Volta Noire
Latitude	5°55' N	5°40' N	8°20' N
Longitude	0°11' E	0°10' E	2°10' W
SPECIFICATIONS			
Height (m)	141	28.5	-
Length (m)	640	9200	-
Capacity (10 ⁶ m ³)	148,000	2000 ± 200	-
Outflow (10 ⁶ m ³ /yr)	30	3800	-
Power (Mw)	912	184	-
Annual Production (GWh)	-	940	-
Irrigation (ha)	Negligible	6000	-

Source: Interafrican Committee for Hydraulic Studies. 1979.

Appendix VIII

Current U.S. AID Projects in Ghana

.....
 * COUNTRY/BUREAU: GHANA PROJECT: 641687 SUB-PROJECT: 10 *
 * TITLE: AGRICULTURAL EXTENSION AND PRODUCTION INITIAL FY: 67 FINAL FY: 73 *

PROBLEM: AGRICULTURE IN GHANA LACKS THE ESSENTIAL INPUTS- IMPROVED SEED, FERTILIZER, AND IMPROVED TECHNIQUES NEEDED TO INCREASE PRODUCTION. **STRATEGY:** THE PROGRAMS WILL BE DESIGNED TO FOSTER INCREASED USE OF AGRICULTURAL INPUTS AND SERVICES SO AS TO FULLY EXPLOIT THE PRODUCTION POTENTIAL OF THE AGRICULTURAL SECTOR.

SUMMARY: THE PROJECT WILL BE DIVIDED INTO TWO MAJOR ACTIVITIES: 1- THE PRODUCTION SUPPORT IMPLEMENTATION PROGRAM WORKS TOWARD SUBSTANTIAL INCREASES IN PRODUCTION (RICE, MAIZE) THROUGH AVAILABILITY OF ESSENTIAL INPUTS (SEED, FERTILIZER, TECHNIQUES). AGRO-ADMINISTRATIVE ASSISTANCE IN PLANNING, MANAGING INCREASED INPUTS IS PROVIDED. 2- FOCUS AND CONCENTRATE PROGRAM DEMONSTRATES OPTIMAL USE OF AGRICULTURAL INPUTS, INCLUDING EXTENSION SERVICE IN ORGANIZATIONAL AND CATALYTIC CAPACITY, PROPERLY INTEGRATED FOR MAXIMUM PRODUCTION. PROGRAM ASSISTS COOPERATORS IN OBTAINING, USING PRODUCTION INPUTS AND SERVICES AND ENCOURAGES OTHER FARMERS TO EMULATE COOPERATORS. TRAINS SEED PRODUCERS. AIO ADVISORS COORDINATE AT REGIONAL LEVEL.

GOAL: TO ASSIST GOB TO ATTAIN ITS GOAL OF INCREASED AGRICULTURAL PRODUCTION. **PURPOSE:** INCREASE USE OF AGRICULTURAL INPUTS AND SERVICES. I

OUTPUTS: IMPROVED SEED MADE AVAILABLE THROUGHOUT GHANA. 900 EXTENSION LEADERS TRAINED. PRODUCTION OF MILLED RICE AND SHIELLED CORN INCREASED. FERTILIZER DISTRIBUTED. 87% OF CERTIFIED SEED PRODUCED BY PRIVATE FARMERS. COOPERATORS INCREASED TO 1300. NATIONAL SEED LAWS IN EFFET. 2 EXTENSION IN-SERVICE TRAINING PROGRAMS ESTABLISHED. MARKET INFORMATION DISSEMINATED. I

.....
 * COUNTRY/BUREAU: GHANA PROJECT: 641693 SUB-PROJECT: 00 *
 * TITLE: AGR ADVISORY SERVICES AND STAFF SUPPORT INITIAL FY: 69 FINAL FY: 74 *

PROBLEM: GHANA LACKS INSTITUTIONAL CAPABILITY TO EFFECTIVELY STUDY AND IMPLEMENT AGRICULTURAL PRODUCTION STRATEGY. **STRATEGY:** STRENGTHEN AGRICULTURAL INSTITUTIONS AND PROGRAMS WITH IMPROVEMENTS AND MODIFICATIONS BASED ON THOROUGH STUDY OF LONG-TERM STRATEGY TO DATE.

SUMMARY: ASSESSES OTHER AIO/GHANA PROGRAMS IN FOOD AND AGRICULTURAL DEVELOPMENT AND PROVIDES RECOMMENDATIONS FOR NEW ACTIVITIES IN AREAS OF SUPPORT TO AGRICULTURAL PRODUCTION. INCREASED ADVISORY AND MATERIAL SUPPORT IS PROVIDED TO AGRICULTURAL PRODUCTION PROGRAMS; MINISTRY TO AGRICULTURE INVOLVEMENT IN PROBLEM ANALYSIS IS INCREASED, AND STATISTICAL ANALYSIS AND PLANNING METHODOLOGIES ARE ADDED TO USAID'S ADVISORY SERVICES. PARTICIPANT TRAINING IS SIGNIFICANT IN ALL SUPPORT ACTIVITIES.

GOAL: INSTITUTIONALIZE EFFECTIVE AGRICULTURAL DEVELOPMENT. **PURPOSE:** DEFINE AND IMPLEMENT LONG-TERM AGRICULTURAL SECTOR STRATEGY. I

OUTPUTS: FINDINGS FROM AGRICULTURAL SECTOR STUDIES INCORPORATED INTO LONG-TERM AGRICULTURAL SECTOR STRATEGY WITH ATTENTION ON MARKETING, STORAGE, DISTRIBUTION, AND ACCESS TO CREDIT; SECTOR PROBLEM ANALYSIS CAPABILITY INSTITUTIONALIZED; ADVISORY LIAISON MAINTAINED BETWEEN KEY GHANA AGRICULTURAL OFFICIALS AND AIO/GHANA TO ENHANCE STRATEGY PROGRESS; PARTICIPANTS TRAINED. I

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• COUNTRY/BUREAU: GHANA

PROJECT: 6410000 SUB-PROJECT: 01

• TITLE: DANFA RURAL HEALTH FAMILY PLAN

INITIAL FY: 76 FINAL FY: 81

PROBLEM: THE RURAL POPULATION IN GHANA SUFFERS FROM THE BURDEN OF PREVENTABLE ILLNESS AND RAPID POPULATION INCREASE FOUND IN MANY DEVELOPING NATIONS. HEALTH AND FAMILY PLANNING SERVICES ARE CONCENTRATED IN URBAN AREAS AND RURAL HEALTH TECHNOLOGY IS NOT WELL DEVELOPED. HENCE, IMPROVEMENTS IN REACHING RURAL POOR WITH APPROPRIATE HEALTH/FAMILY PLANNING SERVICES REQUIRES OPERATIONAL RESEARCH TO DISCOVER COST EFFECTIVE, APPLICABLE METHODS FOR DELIVERY OF NECESSARY DECENTRALIZED/GENERALIZED HEALTH/FAMILY PLANNING SERVICES.

STRATEGY: NINE YEAR PROJECT CONSISTS OF GRANT, TECHNICAL ADVISORY ASSISTANCE BY AIG AND UCLA STAFF, PARTICIPANT TRAINING, AND COMMITMENT TO IMPROVE TRAINING AND OPERATIONAL RESEARCH CAPACITY OF GHANA MEDICAL SCHOOL. GOVERNMENT OF GHANA SUPPLIES STAFF, RECURRING COSTS, AND OPERATIONAL SUPPORT.

SUMMARY:

UCLA PROVIDES TECHNICAL ASSISTANCE TO GHANA MEDICAL SCHOOL, DEPT OF PREVENTIVE AND SOCIAL MEDICINE, (GMS) TO IMPROVE ITS CAPACITY TO TRAIN HEALTH WORKERS AND TO EVALUATE ALTERNATIVE APPROACHES TO DELIVERY OF HEALTH AND FAMILY PLANNING SERVICES IN RURAL AREAS. SUBPROJECT PROVIDES TRAINING FOR MEDICAL STUDENTS, PHYSICIANS, PARAMEDICAL PERSONNEL IN SPECIAL PROBLEM AREAS OF RURAL HEALTH CARE AND PP DELIVERY. DANFA RURAL HEALTH CENTER PROVIDES SPECIAL TRAINING FOR MEN OF HEALTH EMPLOYEES, STUDENT NURSES, HEALTH PERSONNEL, AND SERVES AS PRIMARY RURAL TEACHING AREA FOR GMS. EMPHASIS IS ON TRAINING RURAL HEALTH TEAM AS UNIT FOR EFFICIENT DELIVERY OF COMPREHENSIVE HEALTH CARE, AND ON USE OF PARAMEDICAL PERSONNEL. EXPERIENCE GAINED FROM DANFA PROJECT HELPS TO DETERMINE MOST EFFECTIVE WAY TO INSTRUCT HEALTH WORKERS IN COMPREHENSIVE HEALTH/PP PROGRAM. TWO WEEK TRAINING PROGRAMS ARE ORGANIZED TO TRAIN SMALL GROUPS OF NON STAFF AND HEALTH WORKER TRAINERS IN ORGANIZATION AND OPERATION OF HEALTH CENTER AND ASSOCIATED COMMUNITY PROGRAMS. STUDENTS ALSO LEARN EVALUATION TECHNIQUES AND OPERATIONAL RESEARCH METHODS. RESEARCH AND STUDY UNIT ARE ESTABLISHED IN UNIVERSITY OF GHANA TO HELP FUNCTIONING AND EVALUATION OF HEALTH CENTER AND RELATED STUDIES. ONGOING OPERATIONS RESEARCH PROGRAM EVALUATES ORGANIZATION, STAFF UTILIZATION, AND FUNCTION OF DANFA HEALTH CENTER. PP EDUCATIONAL MATERIALS ARE PREPARED FOR INTEGRATION INTO CURRICULUM OF EXISTING HEALTH TRAINING INSTITUTES. ASSISTANCE IS ALSO GIVEN TO FACULTY OF EXISTING HEALTH TRAINING INSTITUTES, DEVELOPING SYLLABI FOR INCORPORATING PP EDUCATION INTO BASIC PROGRAMS AND STRENGTHENING TEAM APPROACH TO SOLVING HEALTH PROBLEMS IN RURAL AREAS. MOST TRAINING IS CONDUCTED BY GHANESE PROJECT STAFF. UCLA TEAM TEACHES AT GMS AND DANFA AND HELPS TRAIN PARAMEDICAL PERSONNEL. PARTICIPANTS STUDY EPIDEMIOLOGY, HEALTH EDUCATION, PUBLIC HEALTH PLANNING, PUBLIC HEALTH MEDICINE, MATERNAL/CHILD HEALTH, NUTRITION, RESEARCH METHODOLOGY IN US. UCLA TEAM INCLUDES OPERATIONS RESEARCH SPECIALIST, PP PHYSICIAN, EPIDEMIOLOGIST, AND HEALTH EDUCATOR. PROJECT PAPER DATED 12/31/75 PROVIDES \$2 MILLION IN USAID FUNDING TO EXTEND THE PROJECT FOR AN ADDITIONAL THREE YEARS. NO SUBSTANTIVE CHANGES IN THE PROJECT DESIGN ARE MADE.

GOAL: ENABLE THE GOVERNMENT OF GHANA (GOG) TO EXTEND AND IMPROVE RURAL HEALTH AND FAMILY PLANNING SERVICES IN A NATIONAL MANNER.

PURPOSE: STRENGTHENING OF THE INSTITUTIONAL CAPABILITY AT THE GHANA MEDICAL SCHOOL TO CONDUCT RESEARCH AND TRAIN DOCTORS AND OTHER HEALTH WORKERS IN THE DELIVERY OF HEALTH AND OTHER FAMILY PLANNING SERVICES.

OUTPUTS: 1. MEDICAL STUDENTS AND DOCTORS TRAINED ON SPECIAL PROBLEMS OF DELIVERY OF RURAL HEALTH CARE AND FAMILY PLANNING. 2. DOCTORS TRAINED IN MANAGEMENT OF A RURAL HEALTH DISTRICT. 3. STRATEGIES DEVELOPED FOR TRAINING OF PROFESSIONALS, PARA-PROFESSIONALS, TRADITIONAL AND VOLUNTARY HEALTH WORKERS IN RURAL GHANA. 4. IN-SERVICE TRAINING FOR HEALTH WORKERS FROM OUTSIDE DANFA AREA. 5. SPECIALISTS TRAINED IN FIELDS REQUIRED TO DEVELOP LONG RANGE TEACHING/RESEARCH PROG OF DEPT OF COMMUNITY HEALTH

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• COUNTRY/BUREAU: GHANA

PROJECT: 6410000 SUB-PROJECT: 00

• TITLE: GHANA MINISTRY OF RURAL HEALTH SERVICES

INITIAL FY: 76 FINAL FY: 81

PROBLEM: GHANA LACKS PLANNING, MANAGEMENT AND ADMINISTRATIVE CAPABILITIES TO EFFECTIVELY DELIVER LOW-COST RURAL HEALTH SERVICES. GHANA'S MINISTRY OF HEALTH NEEDS OPERATIONAL AND MANAGEMENT SUPPORT AND TRAINING TO DELIVER ITS EXPANDING HEALTH CARE SYSTEM.

STRATEGY: PROJECT IS LONG-TERM PUBLIC SECTOR, IMPROVING EXISTING INSTITUTIONS.

SUMMARY: HEALTH PLANNING ADVISOR DEVELOPS FRAMEWORK FOR MGMT SYSTEMS AND THEIR INSTALLATION. THE PLAN IDENTIFIES CONSTRAINTS, IMPROVES RESOURCE UTILIZATION & ORGANIZATIONAL COMMUNICATION, DEVELOPS WIDE-REACHING COST-EFFECTIVE DELIVERY SERVICE, CREATES MGMT INFORMATION/EVALUATION SYSTEM & BUDGET GUIDELINES, A LONG PLANNING & BUDGET WITH ADMINISTRATIVE/MGMT STRUCTURE. PARTICIPANTS TRAINED IN US IN HEALTH PLANNING, BUDGET ADMINISTRATION, BIO-STATISTICS, ENVIRONMENTAL SANITATION, HEALTH ECONOMICS AND HANDBOOK ORGANIZATION. PLANNING UNIT FORMED TO PLAN MGMT ACTIVITIES AND EVALUATE PROGRAMS. TRAINED PARTICIPANTS IMPLEMENT MANAGEMENT SYSTEM INSTALLATION INCLUDING NEW TRAINING SYSTEMS AND DEPLOYMENT OF PLANNING AND MANAGEMENT SYSTEMS.

GOAL: DELIVERY LOW COST EFFECTIVE HEALTH SERVICE TO A LARGE PROPORTION OF THE POOREST POPULATION OF RURAL GHANA.

PURPOSE: DEVELOPMENT IN THE MINISTRY OF HEALTH OF SUITABLE ORGANIZATIONAL ARRANGEMENTS AND SYSTEMS FOR PLANNING, MANAGEMENT AND ADMINISTRATION DIRECTED TOWARD THE ACHIEVEMENT OF BROAD LOW COST AND EFFECTIVE RURAL HEALTH SERVICES COVERAGE IN GHANA.

OUTPUTS: A. PLANNING UNIT PERMANENTLY ESTABLISHED AND STAFFED WITH MINIMUM OF SEVEN PROFESSIONAL STAFF. B. HEALTH OFFICIALS AT THE CENTRAL MINISTRY, & REGIONAL OFFICES ATTENDING AND PARTICIPATING IN PLANNING & MGMT COURSES & SEMINARS. C. COMPLETED 5-YEAR SECTOR PLANS & IMPLEMENTATION STRATEGY. D. PLANNING UNIT ANALYSIS/RECOMMENDATION FOR EXTERNAL ASSISTANCE PRESENTED TO DONORS FOR IMPLEMENTATION OF PHASE 2 DELIVERY OF SERVICES. E. VEHICLE MAINTENANCE & SAFETY COURSES ESTABLISHED

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 * COUNTRY/BUREAU: GHANA PROJECT: 641873 SUB-PROJECT: 00 *
 * TITLE: DISTRICT PLANNING & RURAL DEV (PHASE I) INITIAL FY: 77 FINAL FY: 80 *

PROBLEM:

VERY LITTLE IS KNOWN ABOUT SMALL FARM SYSTEMS IN GHANA. SINCE FARMING SYSTEMS VARY CONSIDERABLY IN DIFFERENT AREAS OF THE COUNTRY, THE COMPONENTS OF COMPREHENSIVE AGRICULTURAL DEVELOPMENT PROGRAMS MUST BE TAILORED TO THE SPECIFIC CONDITIONS OF THE AREA IN QUESTION. THIS CAN ONLY BE ACHIEVED IF PROGRAMS ARE PLANNED AND EXECUTED AT LOCAL, DECENTRALIZED LEVELS. DUE TO LIMITED LOCAL PARTICIPATION IN PROJECT DESIGN AND EXECUTION, MANY OF THESE EFFORTS HAVE FAILED.

STRATEGY:

1-YEAR PROJECT CONSISTS OF GRANT, TECHNICAL ADVISOR, SHORT-TERM CONSULTANTS, VEHICLES, RESEARCH STUDIES (BY MOST COUNTRY INSTITUTIONS), AND SUPPORT FOR EXPERIMENTAL PROJECT DESIGN ACTIVITIES TO DEVELOP A DECENTRALIZED APPROACH TO INTEGRATED RURAL DEVELOPMENT. MOST COUNTRY PROVIDES LOCAL RESOURCES, SUCCESSIONARY SUPPORT, AND PROJECT MANAGEMENT.

SUMMARY:

GRANT PROVIDED TO THE GOVERNMENT OF GHANA TO DEVELOP THE CAPACITIES OF THE ATEBUBU DISTRICT COUNCIL AND ITS SUPPORTING INSTITUTIONS TO EFFECTIVELY INVOLVE THE DISTRICT'S POPULATION IN THE PLANNING, MANAGEMENT, IMPLEMENTATION, AND EVALUATION OF AN INTEGRATED RURAL DEVELOPMENT PROGRAM. BY USING THE PROCESS APPROACH TO PROJECT DEVELOPMENT, SPECIFIC PROJECT ACTIVITIES WILL EVOLVE OUT OF LOCAL PARTICIPATION IN THE DECISION-MAKING PROCESS AND THROUGH EXPERIMENTATION WITH TRIAL ACTIVITIES. THE GOV HAS DECENTRALIZED ITS DECISION-MAKING WITH THE DISTRICT COUNCIL RESPONSIBLE FOR DEVELOPMENT PLANNING AND LOCAL COUNCILS AND VILLAGE DEVELOPMENT COMMITTEES RESPONSIBLE FOR IDENTIFYING AND CARRYING OUT SELF-HELP ACTIVITIES WITHIN THE DISTRICT'S DEVELOPMENT PLAN. SINCE GOV'S DECENTRALIZATION STRATEGY IS NEW AND UNTESTED, THIS PROJECT IS ONLY A "PRE-IMPLEMENTATION PHASE" FOR RESEARCH AND EXPERIMENTATION WHICH WILL BE FOLLOWED BY A MUCH LARGER "IMPLEMENTATION PHASE" PROJECT. THE PRESENT PROJECT WILL IDENTIFY, DEVELOP, AND TEST THE EFFECTIVENESS AND REPLICABILITY OF: 1) METHODS FOR IDENTIFYING THE POTENTIALS FOR AND THE CRITICAL OBSTACLES TO DISTRICT DEVELOPMENTAL CHANGE; 2) METHODS FOR IMPROVING THE PLANNING AND MANAGEMENT CAPABILITIES OF THE DISTRICT COUNCIL AND ITS SUPPORTING INSTITUTIONS; 3) AN INTEGRATED SYSTEM FOR INCREASING THE PRODUCTION AND INCOMES OF SMALL FARMERS WITHIN THE DISTRICT; 4) ALTERNATIVE INCOME-GENERATING ACTIVITIES THAT INCREASE RURAL EMPLOYMENT OPPORTUNITIES; 5) METHODS FOR CREATING LOCAL SELF-HELP CAPABILITIES IN THE DEVELOPMENT OF ECONOMIC AND EVENTUAL SOCIAL INFRASTRUCTURE; 6) APPROACHES TO NON-FORMAL EDUCATION AND LOCAL ORGANIZATIONAL DEVELOPMENT WHICH WILL SUPPORT DEVELOPMENT; AND 7) A LOW-COST, EASILY MANAGED INFORMATION SYSTEM THAT WILL ALLOW THE DISTRICT COUNCIL TO MONITOR THE VARIOUS DEVELOPMENT ACTIVITIES. USAID WILL PROVIDE A DEVELOPMENT PLANNING ADVISOR, SHORT-TERM CONSULTANTS, RESEARCH STUDIES (BY A GHANAIAN INSTITUTION), PLUS FUNDS FOR EXPERIMENTAL PROJECT DESIGN ACTIVITIES.

GOALS:

IMPROVE THE ECONOMIC AND SOCIAL WELL-BEING OF RURAL GHANAIANS IN A WAY THAT BECOMES SELF-SUSTAINING.

PURPOSE:

DEVELOP THE CAPACITIES OF THE ATEBUBU DISTRICT COUNCIL AND ITS SUPPORTING SYSTEM OF LOCAL, REGIONAL, AND NATIONAL INSTITUTIONS TO EFFECTIVELY INVOLVE THE DISTRICT'S POPULATION IN THE PLANNING, MANAGEMENT, IMPLEMENTATION, AND EVALUATION OF AN INTEGRATED RURAL DEVELOPMENT PROGRAM DIRECTED TOWARDS ACHIEVING THE DISTRICT'S GROWTH, EMPLOYMENT, AND EQUITY OBJECTIVES.

OUTPUTS:

1. METHODS FOR IDENTIFYING POTENTIALS FOR & CRITICAL OBSTACLES TO DISTRICT DEV CHANGE EVOLVED. 2. METHOD FOR IMPROVING PLNG CAPABILITIES OF A DISTRICT COUNCIL & SUPPORTING INSTITUTIONS IDENTIFIED. 3. METHODS FOR CREATING LOCAL SELF-HELP CAPABILITIES IN THE DEV OF ECON & EVENTUAL SOCIAL INFRASTRUCTURE IDENTIFIED. 4. A LOW-COST EASILY MANAGED INFO SYSTEM THAT ALLOWS DIST COUNCIL & OTHER DECISION MAKERS TO MONITOR, EVAL & CORRECT INDIVIDUAL & COMBINED EFFECTS OF THE VARIOUS DEV ACTIVITIES ESTAB. 5. AN INTEGRATED SYSTEM APPROACH FOR INCREASING PROD & INCOMES OF SMALL FARMERS. 6. THE DISTRICT WORKED OUT. 7. IDEAS OF INCOME-GENERATING ACTIVITIES. 8. APPROACHES TO NON-FORMAL ED & LOCAL ORGAN DEV TO IMP AG PROD IDENTIF.

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 * COUNTRY/BUREAU: GHANA PROJECT: 641876 SUB-PROJECT: 00 *
 * TITLE: AGRICULTURE MANAGEMENT DEVELOPMENT INITIAL FY: 75 FINAL FY: 81 *

PROBLEM:

GHANA HAS A LARGE AND GROWING FOOD DEFICIT. THE INCREASING DEFICIENCIES IN DIET QUALITY AS IS REFLECTED IN CALORIC AND PROTEIN INTAKE, HAVE MOST SEVERELY AFFECTED THE LOWER INCOME FAMILIES IN THE RURAL AREAS.

STRATEGY:

THE PROJECT WILL FOCUS ON IMPROVING THE MANAGERIAL EFFECTIVENESS OF MOA PERSONNEL, HELP TO ESTABLISH SPECIFIC OBJECTIVES AND PRIORITIES, AND DEVELOP THE CAPACITY TO PLAN AND IMPLEMENT PROGRAMS.

SUMMARY:

AN AGRICULTURE MANAGEMENT TRAINING PROGRAM WILL BE REQUIRED FOR MANAGERS AT ALL LEVELS IN THE MOA. IT CONSISTS OF: A TWO-YEAR ANNUAL IN-SERVICE MANAGEMENT TRAINING PROGRAM TO HELP IMPROVE THE MANAGEMENT OF SERVICES AND PROGRAMS FOR FARMERS; A ONE-YEAR DIPLOMA PROGRAM THAT WILL PROVIDE THE REQUIRED SKILLS FOR EFFECTIVE MANAGEMENT OF AGRICULTURAL PROGRAMS; A TWO-YEAR GRADUATE LEVEL DEGREE PROGRAM TO ADMINISTRATORS IN PLANNING AND MANAGEMENT POSITIONS. THE UNIVERSITY OF GHANA AND SIMPL WILL PROVIDE THE APPROPRIATE MIX OF AGRICULTURE AND MANAGEMENT TO MEET THE PRACTICAL NEEDS OF THE MOA AND OTHER AGRICULTURAL SECTOR ORGANIZATIONS.

GOALS:

TO INCREASE AGRICULTURAL FOOD CROP PRODUCTION, ESPECIALLY OF SMALL FARMS, RESULTING IN HIGHER FARM INCOMES, THEREBY IMPROVING INCOME DISTRIBUTION. I

PURPOSE:

TO DEVELOP A SELF-SUSTAINING INDIGENOUS AGRICULTURAL MANAGEMENT AND PLANNING CAPABILITY WHICH WILL LEAD TO IMPROVED PLANNING, ALLOCATION AND UTILIZATION OF AGRICULTURAL SECTOR RESOURCES IN GHANA. I

OUTPUTS:

ESTABLISHMENT OF CENTRAL MANAGED TRAINING OFFICE IN MOA; IMPROVED CAPABILITY OF MOA OFFICIALS IN PLANNING AND MANAGEMENT SKILLS; ENHANCED RELATIONSHIPS AMONG THE INSTITUTIONS INVOLVED IN TRAINING OF OFFICIALS; ADMINISTERING AGRICULTURAL PROGRAMS; INCREASED AWARENESS AND IMPROVED CAPABILITY OF GHANA AND SIMPL UNIVERSITIES; FACILITIES FOR CONTINUOUS IN-SERVICE TRAINING PROGRAMS; DEVELOPMENT OF INSTRUCTIONAL CAPABILITY AND MATERIALS IN AGR MANAGEMENT. I

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 * COUNTRY/BUREAU: GHANA PROJECT: 641686 SUB-PROJECT: 02 *
 * TITLE: DANPA RURAL HEALTH FAMILY PLAN INITIAL FY: 76 FINAL FY: 81 *

PROBLEM: GHANA'S POPULATION IS ESTIMATED TO BE INCREASING AT 2.7 TO 3.26 PER YEAR. HEALTH AND VITAL STATISTICS ARE VERY INADEQUATE, AND ACCURACY OF SUCH FIGURES AS ARE GIVEN CANNOT BE GUARANTEED. NO DATA ARE AVAILABLE ON EFFECTIVE METHODS OF MOTIVATION, ATTITUDES, OR ACCEPTANCE OF VARIOUS TYPES OF CONTRACEPTIVES. UNRELIABLE DATA CONCERNING DISEASE PREVALENCE, INCIDENCE OF HEALTH PROBLEMS. DEMOGRAPHIC CHARACTERISTICS HINDER EFFECTIVE PLANNING OF HEALTH CARE DELIVERY. ABSENCE OF ADEQUATE BASELINE DATA IMPAIRS ASSESSMENT OF HEALTH SERVICE IMPACT.

STRATEGY: 3-YEAR PROJECT CONSISTING OF GRANT, TECHNICAL ADVISORY ASSISTANCE BY UNIVERSITY OF CALIFORNIA AT LOS ANGELES (UCLA), PARTICIPANT TRAINING, COMMITTEE TO GATHER AND EVALUATE HEALTH AND POPULATION STATISTICS. GOVERNMENT OF GHANA (GGG) SUPPLIES DATA REGARDING COSTS THROUGH MINISTRY OF HEALTH (MOH).

SUMMARY: INSTITUTIONAL DEVELOPMENT AGREEMENT WITH UCLA PROVIDES TECHNICAL ASSISTANCE TO DEPT OF PREVENTIVE AND SOCIAL MEDICINE (DPSM). GHANA MEDICAL SCHOOL, FOR STUDY OF MEDICAL CARE AND PR NEGOS AND USES IN DANPA REGION. DATA HELPS DEVELOP COST EFFECTIVE INTEGRATED RURAL HEALTH SERVICE. BASELINE CENSUS OF DANPA POPULATION IS UNDERTAKEN BEFORE NEW HEALTH SERVICE PROGRAM IS IMPLEMENTED. DEMOGRAPHIC ANALYSIS IS UPDATED YEARLY WITH VITAL STATISTICS GATHERED BY VILLAGE REGISTRARS AND PROJECT TEAM. OTHER STUDIES INCLUDE MORTALITY SURVEY, MIDWIFE PRACTICES, MEDICAL CARE ATTITUDES AND SERVICE PATTERNS FOR MOTHERS AND CHILDREN; PR SURVEYS GATHER DATA ON FERTILITY, KNOWLEDGE, ATTITUDES, AND PRACTICES (NAPI). VILLAGE HEALTH SURVEY INTERVIEWS 3000 PEOPLE ON RECENT ILLNESSES AND USE OF HEALTH SERVICES. HOUSING CONDITIONS, ECONOMIC STATUS ARE ASSESSED, AND EVERY PERSON IS GIVEN COMPLETE PHYSICAL AND LIMITED LABORATORY EXAM. DATA PROVIDES RATES FOR MEDICAL PROBLEMS, PROFILE OF LARGE FAMILIES. SERIES OF INTERRELATED FOLLOW-UP STUDIES MADE 3 TIMES OVER 3 YEARS PROVIDES UPDATED INFORMATION. SPECIAL STUDIES DETERMINE EFFECTIVE PR MOTIVATIONAL TECHNIQUES, NUTRITIONAL STATUS, CHILD DEVELOPMENT PATTERNS, EFFECT OF SPECIAL DISEASES, PR AND MIDWIFERY TECHNIQUES OF TRADITIONAL BIRTH ATTENDANTS. DATA USED TO EVALUATE PROGRAM IMPACT AND EFFECT OF MOTIVATIONAL TECHNIQUES. SIMILAR STUDIES ARE CONDUCTED AS CONTROL MEASURES IN COMPARABLE AREAS OF GHANA. ADDITIONAL DATA OBTAINED FROM DEMOGRAPHIC SURVEY AND 1970 CENSUS. FUNCTIONAL ANALYSIS OF DANPA HEALTH CENTER ORGANIZATION AND TIMED PATIENT FLOW RESULTS IN JOB DESCRIPTIONS FOR HEALTH WORKERS; SOP SYSTEM USES DATA IN FUNCTIONAL ANALYSES, COST EFFECTIVENESS STUDIES, AND IN CONSTRUCTION MODELS OF FACTOR AFFECTING FERTILITY AND HEALTH STATUS. PARTICIPANTS TRAINED IN COMPUTER PROGRAMMING AND RECORDS MANAGEMENT. UCLA BACKSTOPPING ASSISTS DESIGN AND OPERATION OF RECORDS/DATA SYSTEM.

GOAL: ENABLE THE GOVERNMENT OF GHANA (GGG) TO EXTEND AND IMPROVE RURAL HEALTH AND FAMILY PLANNING SERVICES IN A NATIONAL MANNER.

PURPOSE: INVESTIGATION OF THE STATE OF THE RURAL GHANAIAN COMMUNITY, CONCENTRATING ON FACTORS ASSOCIATED WITH HEALTH AND FAMILY PLANNING BEHAVIOR.

OUTPUTS: 1. HEALTH AND HEALTH-RELATED CHARACTERISTICS DEFINED FOR PLANNING AND EVALUATION; DEMOGRAPHIC CHARACTERISTICS, DISEASE PREVALENCE, INCIDENCE OF HEALTH PROBLEMS. 2. CHARACTERISTICS AND DETERMINANTS OF HEALTH AND FAMILY PLANNING-RELATED BEHAVIOR; HEALTH POST RECORDS, COMMUNITY PARTICIPATION, SURVEYS. 3. PHYSICAL AND SOCIAL ENVIRONMENT EXAMINED; RELATIONSHIP OF THESE FACTORS TO HEALTH AND HEALTH-RELATED BEHAVIOR; LONGITUDINAL SURVEYS MADE. HEALTH-RELATED SOCIAL FACTORS DETERMINED.

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 * COUNTRY/BUREAU: GHANA PROJECT: 641687 SUB-PROJECT: 08 *
 * TITLE: WOMEN IN NATIONAL DEVELOPMENT IN GHANA INITIAL FY: 75 FINAL FY: 77 *

PROBLEM: THE FAMILY RESPONSIBILITIES OF THE WOMEN AND HER RESPONSIBILITIES FOR ECONOMIC PRODUCTION ARE OFTEN IN CONFLICT AND AS A RESULT SHE IS CRITICIZED FOR HER FAILURE TO PERFORM WELL IN EITHER TASK.

STRATEGY: INSTRUCT WOMEN IN EFFICIENT LABOR-SAVING METHODS HOUSEHOLD MANAGEMENT AND MARKETING.

SUMMARY: INFORMATION TO THE WOMAN WILL BE CARRIED OUT THROUGH SUPPORT TO THE HOME EXTENSION UNIT OF THE MINISTRY OF AGRICULTURE AND THE GHANA ASSEMBLY OF WOMEN. THE HOME EXTENSION UNIT WILL DEVELOP DEMONSTRATION HOUSES WHICH WILL SERVE AS TRAINING FACILITIES FOR EXTENSION PERSONNEL AND HOUSEWIVES. THE UNIV OF GHANA HAS SUCH A HOUSE AND WILL PROVIDE LEADERSHIP FOR THE PROJECT. THE 1ST TR. IS MODEL HOUSING UNITS WILL BE BUILT FOR TEACHING/LEARNING AND RESEARCH PURPOSES. GHANA ASSEMBLY OF WOMEN WILL USE THEIR FUNDS TO INCREASE THEIR DEVELOPMENT OF INFORMAL EDUCATION PROGRAMS AND EDUCATIONAL MATERIALS.

GOAL: TO ENHANCE THE CONTRIBUTION OF GHANAIAN FARM WOMEN TO RURAL DEVELOPMENT. I

PURPOSE: IMPROVED EFFECTIVENESS OF WOMEN IN PERFORMING THEIR TASKS. I

OUTPUTS: IMPROVED FARM HOME MANAGEMENT TECHNIQUES LEARNED BY FARM WOMEN AT THE FARM DEMONSTRATION HOUSES AND WORKSHOPS. HOUSE PROVIDING A PLACE FOR CONTINUOUS TEACHING/LEARNING RESEARCH PROCESS. DEMONSTRATION HOUSES DEVELOPED. THE GHANA ASSEMBLY OF WOMEN HAS PREPARED MATERIALS ON FOOD GROWING, PREPARATION AND PRESERVATION FOR USE AS PROGRAM MATERIALS. ALSO PROVIDE: WORKSHOPS EXHIBITS AND OTHER INFORMAL EDUCATION PROGRAMS. I

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 * COUNTRY/BUREAU: GHANA PROJECT: 641364 SUB-PROJECT: 01 *
 * TITLE: POPULATION PROGRAM SUPPORT INITIAL FY: 71 FINAL FY: 81 *

PROBLEM: GHANA'S FERTILITY RATE OF 6.8 IS ONE OF THE HIGHEST IN THE WORLD. CURRENT INFORMATION INDICATES THAT MAJOR DIFFICULTY STEMS FROM A STRONG CULTURAL BIAS FAVORING LARGE FAMILIES. WHILE GHANA HAS SUCCEEDED IN ESTABLISHING A NATL FAMILY PLANNING PROGRAM, MANY OF ITS PERSONNEL LACK SUFFICIENT EXPERIENCE AND TRAINING TO EFFECTIVELY MANAGE & PROMOTE FAMILY PLANNING SERVICES. GSN ALSO LACKS STATISTICAL CAPABILITY NECESSARY TO PERIODICALLY ASSESS THE PROGRAM'S EFFECTIVENESS AND ALTER ITS DIRECTION AS INDICATED.

STRATEGY: THREE-YEAR PROJECT CONSISTS OF GRANT, TECHNICAL ADVISORY ASSISTANCE, AND PARTICIPANT TRAINING TO SUPPORT GHANA'S NATIONAL FAMILY PLANNING PROGRAM. USAID WILL ALSO FINANCE PROGRAM'S CONTRACEPTIVE STOCKS. HOST-COUNTRY PROVIDES INSTITUTIONAL SUPPORT AND LONG-TERM MAINTENANCE. FORD FOUNDATION WILL ALSO PROVIDE TECHNICAL ASSISTANCE.

SUMMARY: GRANT, TECH ADVISORY ASSISTANCE, PARTICIPANT TRNG & COMMODITIES ARE PROVIDED TO INCREASE USE & ACCEPTABILITY OF FAMILY PLANNING SERVICES IN GHANA. SEVERAL COMPONENTS OF GSN'S NEWLY ESTABLISHED NATL FAMILY PLNGG PROGRAM (NFPF) WILL RECEIVE ASSISTANCE. USAID WILL FINANCE ALL NFPF REQUIREMENTS FOR CONTRACEPTIVES & CLINICAL EQUIPMENT. SUPPLY MANAGEMENT BACKSTOPPING & ADVISORY SERVICES ON SHORT-TERM BASIS WILL ALSO BE PROVIDED. MAJOR DEMOGRAPHIC SURVEY AS WELL AS SMALLER SURVEYS WILL BE CONDUCTED TO ASSESS PROGRAM'S IMPACT AND DETERMINE ITS FUTURE DIRECTIONS. NFPF WILL RETAIN LOCAL EXPERTS IN STATISTICS, DEMOGRAPHY, ECONOMICS & SOCIOLOGY. FOREIGN EXPERTISE WILL BE REQUIRED IN OPERATIONS RESEARCH, POPULATION ECONOMICS & SOCIAL ANTHROPOLOGY. PROJ WILL UPGRADE SKILLS OF PERSONNEL IN A VARIETY OF GSN AGENCIES & INSTITUTIONS PLAYING A SIGNIFICANT ROLE IN THE POPULATION/FAMILY PLNGG FIELD. TWO PARTICIPANTS FROM GHANAIAN PLANNED PARENTHOOD ASSOC WILL PARTICIPATE IN SUMMER WORKSHOPS FOR FAMILY PLNGG GENERALISTS AT A US UNIVERSITY. PARTICIPANT TRNG WILL BE PROVIDED TO CENTRAL BUREAU OF STATISTICS PERSONNEL IN AREAS OF DATA PROCESSING AND SAMPLING & SURVEY TECHNIQUES. 2 RURAL DEVELOPMENT OFFICERS WILL PARTICIPATE IN PHILIPPINE PROGRAM WHICH INCLUDES FAMILY PLNGG EDUC-MOTIVATION TRNG. GSN DEMOGRAPHIC UNIT (DU) & INSTITUTE OF STATISTICAL, SOCIAL & ECONOMIC RESEARCH ALSO WILL REIVE PARTICIPANT TRNG SUPPORT. DU WILL REQUIRE POST-GRAD TRNG FOR 1 OR 2 PROMISING DEMOGRAPHERS PER YR. USAID WILL SUPPORT NFPF EDUC CAMPAIGN BY FINANCING DEVELOPMENT & PUBLICATION OF A "PEOPLE PROBLEM" PAMPHLET. US TECHNICIANS SUPPORTED BY FORD FOUNDATION WILL DEVELOP FAMILY PLNGG RELATED COMIC BOOKS, PHOTO NOVEL & SOAP OPERA MATERIALS. FORD FOUNDATION WILL ALSO PROVIDE GENERAL ADVISOR TO NFPF AND FINANCE FEASIBILITY STUDY FOR COMMERCIAL DISTRIBUTION OF CONTRACEPTIVES. HOST-COUNTRY WILL PROVIDE INSTITUTIONAL SUPPORT AND LONG-TERM MAINTENANCE. PRIMARY BENEFICIARIES ARE FERTILE AGE-GROUP WITHIN GHANAIAN POPULATION.

GOAL: RATE OF POPULATION GROWTH REDUCED IN GHANA. **PURPOSE:** ACCEPTABILITY AND USE OF FAMILY PLANNING METHODS INCREASED.

OUTPUTS: 1. CONTRACEPTIVES STOCKED & DISTRIBUTED TO FAMILY PLNGG CLINICS. 2. IMPACT OF NATL FAMILY PLNGG PROGRAM (NFPF) ASSESSED; 3. MAJOR DEMOGRAPHIC SURVEYS CONDUCTED & EXTENT OF USAGE OF VARIOUS TYPES OF CONTRACEPTIVES ASSESSED. 4. SMALLER SURVEYS CONDUCTED CONCERNING EFFECTIVENESS OF NFPF COMPONENTS. 5. STAFF CAPABILITIES UPGRADED WITHIN GSN AGENCIES & INSTITUTIONS HAVING SIGNIFICANT ROLE IN POP/FAMILY PLNGG FIELD. 6. FAMILY PLNGG INFORMATION & ASSISTANCE CAMPAIGNS IMPLEMENTED; 7. "PEOPLE PROBLEM" PAMPHLET DEVELOPED AND DISTRIBUTED. 8. COMIC BOOK, PHOTO NOVEL AND SOAP OPERA MATERIALS PREPARED PROMOTING FAMILY PLANNING SERVICES.

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 * COUNTRY/BUREAU: GHANA PROJECT: 641364 SUB-PROJECT: 02 *
 * TITLE: NATIONAL AGRICULTURAL PLANNING IN GHANA INITIAL FY: 68 FINAL FY: 77 *

PROBLEM: GHANA'S AGRICULTURE IS IN A STAGNANT CONDITION. DEVELOPMENT COORDINATION UNIT (DCU) IS VIRTUALLY INEFFECTIVE BECAUSE OF LACK OF STAFF, ESPECIALLY LACK OF TRAINED AGRICULTURAL ECONOMISTS AND AGRICULTURAL PROGRAM MANAGERS. IT IS NECESSARY TO PROVIDE GOVERNMENT OF GHANA (GOG) WITH CAPABILITY TO STIMULATE GREATER AGRICULTURAL PRODUCTION.

STRATEGY: PROVIDE TWO OPER EXPERTS IN AGRICULTURE ADMINISTRATION AND AGRICULTURE ECONOMICS FOR FOUR YEARS TO FUNCTION AS IMPORTANT OPERATIONAL PART OF THE DCU. THESE OPER MEN WILL ASSIST THE DCU IN PLANNING, PROGRAMMING, BUDGETING, AND IMPLEMENTING SOUND AGRICULTURE DEVELOPMENT PROJECTS AND CONCURRENTLY TRAIN AND PROVIDE MANAGEMENT GUIDANCE.

SUMMARY: TO OVERCOME LACK OF TRAINED AGRICULTURAL ECONOMISTS AND AGRICULTURAL PROGRAM MANAGERS THE MISSION, MINISTRY OF AGRICULTURE, UNIVERSITY OF GHANA, AND GHANA INSTITUTE OF MANAGEMENT AND PUBLIC ADMINISTRATION ARE JOINTLY ORGANIZING NEW PROJECT SYS, AGRICULTURE MANAGEMENT DEVELOPMENT, TO CREATE LARGE CADRE OF MANAGEMENT AND MANPOWER ORIENTED PROFESSIONALS TO STAFF ALL ENTITIES REQUIRING SUCH SERVICES IN AGRICULTURAL SECTOR. AS THIS CURRENT PROJECT DRAWS TO AN END, FOLLOW-ON PROGRAMS ARE BEING ORGANIZED UNDER NEW PROJECTS IN FERTILIZER, SEED, SOYBEAN, AGRICULTURAL CREDIT, AND MANPOWER/MANAGEMENT TRAINING DEVELOPMENT.

GOAL: ASSIST GOVERNMENT OF GHANA (GOG) IN BRINGING ABOUT POLICY REFORMS FOR AGRICULTURAL DEVELOPMENT. 1 **PURPOSE:** ASSIST MINISTRY OF AGRICULTURE (MOA) TO DEVELOP AND OPERATE THE DEVELOPMENT COORDINATION UNIT. 1

OUTPUTS: 1. PLANNING AND COORDINATION UNIT (PCU) PERMANENTLY ESTABLISHED IN SECRETARIAT OF MOA. 2. PCU OPERATING AT FULL STRENGTH. 3. BUDGETS PREPARED BY PCU. 4. PROJECTS PREPARED BY ECONOMICS AND MARKETING DIVISION. 5. REVIEW AND EVALUATION PROCESS BEING PERFORMED BY PCU PERSONNEL. 1

PROJECT: 0-18055 SUB-PROJECT: 65
 COUNTRY/BUREAU: GHANA
 TITLE: DANFA RURAL HEALTH FAMILY PLAN
 INITIAL FYI TO FINAL FYI 81

PROBLEM: GHANA LACKS DECENTRALIZED, COMPREHENSIVE FAMILY PLANNING (FP)/HEALTH CARE IN RURAL AREAS. BUT WITH PROPER RESEARCH, PLANNING, AND MANAGEMENT OF AVAILABLE RESOURCES, IMPROVEMENTS IN RURAL HEALTH SERVICE COULD BE MADE. HOWEVER, RURAL-ORIENTED HEALTH SYSTEMS HAVE NOT BEEN FULLY DEVELOPED AND EXAMINED. AREAS AND PROBLEMS ARE NOT ALWAYS FULLY RECOGNIZED. GHANA CURRENTLY LACKS CAPACITY TO TEST MODELS OF HEALTH/FP DELIVERY SYSTEMS TO HAVE MOST EFFECTIVE USE OF ITS AVAILABLE RESOURCES.

STRATEGY: 9-YEAR PROJECT CONSISTS OF GRANT, TECHNICAL ADVISORY ASSISTANCE BY UNIVERSITY OF CALIFORNIA AT LOS ANGELES (UCLA), PARTICIPANT TRAINING, COORDINATION TO TEST VARIOUS HEALTH DELIVERY SYSTEM MODELS. GOVERNMENT OF GHANA (GOG) SUPPLIES STAFF, RECURRING COSTS, OPERATIONAL SUPPORT.

SL-1001

UCLA PROVIDES TECH ASST TO GHANA MEDICAL SCHOOL (GMS) TO TEST HEALTH CARE SYSTEMS IN 6 RURAL AREAS AROUND ACCRA. AREA 1 IS CONTROL. IN AREA 1 DANFA RURAL HEALTH CENTER RUNS HEALTH AND FP OUTREACH, WITH 3 SATELLITE CLINICS OPEN 1 DAY A WEEK. PROVIDES SIMPLE MEDICAL CARE, MCH SERVICES, AND HEALTH/NUTRITION EDUCATION. HEALTH AIDE IS SELECTED FROM EACH VILLAGE AND TRAINED IN FIRST AID, SANITATION, MIDWIFERY, FP, AND CHILD CARE. LOCAL MIDWIVES/TRADITIONAL BIRTH ATTENDANTS TRAINED IN IMPROVED PRACTICES. HEALTH EDUC ASSISTANTS PROVIDE MOTIVATIONAL GUIDANCE IN DISEASE PREVENTION, NUTRITION, SANITATION, FP, AND COMMUNITY DEVEL. CONTRACEPTIVES PROVIDED COMMERCIAL. AREA 2 HAS HEALTH POSTS WITH 2 PARAMEDICS, HEALTH EDUC ASSISTANTS, AND IN VILLAGES. BIRTH ATTENDANTS ARE TRAINED IN IMPROVED PRACTICES. COMMERCIAL OUTLETS AND VOLUNTEERS DISTRIBUTE CONTRACEPTIVES. MOBILE FP TEAM PHASED OUT AS COMMUNITY-BASED PROGRAM GROWS. AREA 3 HAS HEALTH POST WITH NORMAL BACK-UP OF PERSONNEL AND COMMUNITIES FROM MINISTRY OF HEALTH. COMMUNITY HEALTH AIDES ARE TRAINED AND HEALTH EDUC ASSISTANTS SERVE AS TECHNICAL LINK. AREAS TEST EFFECTIVENESS OF FP ALONE, FP WITH HEALTH EDUCATION, AND FP IN ADDITION TO COMPREHENSIVE HEALTH SERVICES (CHS). CHS INCLUDES PREVENTIVE AND CURATIVE SERVICES IN COMMUNITY AND IN CENTER. PARAMEDICS PROVIDE ALL ROUTINE HEALTH SERVICES; DOCTORS SUPERVISE, TELCH, AND HANDLE SPECIAL PROBLEMS. FP TEAMS INTRODUCE INFORMATION/REFERRAL SYSTEM. HEALTH EDUC TEAMS EXAMINE VILLAGE HEALTH PRACTICES AND WILL TAILOR HEALTH/FP EDUCATION PROGRAMS TO THEM. ONGOING OPERATIONS RESEARCH EVALUATES ORGANIZATION, STAFF UTILIZATION, FUNCTIONING OF HEALTH CENTER, AND COMMUNITY PROGRAMS. UCLA TEAM PROVIDES ADVISORS IN OPERATIONS RESEARCH, HEALTH EDUCATION, EPIDEMIOLOGY, AND FAMILY PLANNING. 1974 PROP CHANGES PROJECT EMPHASIS TO OPERATIONAL RESEARCH ON PROVIDING RURAL HEALTH AND FAMILY PLANNING SERVICES UNDER VARIOUS DELIVERY SYSTEMS.

SCALE:

ENABLE THE GOVERNMENT OF GHANA (GOG) TO EXTEND AND IMPROVE RURAL HEALTH AND FAMILY PLANNING (FP) SERVICES IN A NATIONAL MANNER.

PURPOSE: DEMONSTRATION OF SEVERAL COST-EFFECTIVE HEALTH CARE SYSTEM MODELS TO INCLUDE FAMILY PLANNING AS AN INTEGRATED COMPONENT SUITABLE TO THE GHANAIAN CONTEXT.

OUTPUTS:

1. SYSTEMS FOR INCREASED ACCESSIBILITY AND ACCEPTABILITY OF SERVICES; FP SERVICES, SATELLITE CLINIC, COMMUNITY-BASED MASS DELIVERY SYSTEMS, EXTENDED SERVICES WITH VOLUNTEERS/TRADITIONAL HEALTH WORKERS. 2. METHODS OF INCREASED COMMUNITY PARTICIPATION IN HEALTH CARE SYSTEM. 3. EFFECTIVENESS OF HUMAN, PHYSICAL AND FINANCIAL RESOURCES; COST, SERVICES, MGMT ANALYZED. 4. SYSTEMS THAT IMPROVE QUALITY OF CARE. 5. SYSTEMS THAT IMPROVE ENVIRONMENTAL SANITATION, WATER SUPPLY, REFUSE.

PROJECT: 0-18055 SUB-PROJECT: 66
 COUNTRY/BUREAU: GHANA
 TITLE: DANFA RURAL HEALTH FAMILY PLAN
 INITIAL FYI TO FINAL FYI 81

PROBLEM:

MANY GOG AGENCIES COULD USE DANFA DATA IN PLANNING, BUDGETING, TRAINING, BUT NO ORGANIZATION EXISTS TO INSURE THAT INFORMATION DEVELOPED IS FORWARDED CONTINUOUSLY TO AGENCIES WHICH NEED IT. CURRENT MEANS OF TRANSMITTING INFORMATION DERIVED FROM PROJECT ACTIVITIES ARE INADEQUATE TO INSURE THAT VALUABLE DATA ARE NEITHER LOST NOR INEFFECTIVELY USED.

STRATEGY: 9-YEAR PROJECT CONSISTS OF GRANT, TECHNICAL ADVISORY ASSISTANCE BY US UNIVERSITY, PARTICIPANT TRAINING, COORDINATION TO DISSEMINATE INFORMATION GAINED FROM DANFA HEALTH CENTER TO INTERESTED AGENCIES. GOV OF GHANA PROVIDES STAFF, TRAINING, AND PAYS RECURRING COSTS.

SL-1001

UCLA PROVIDES TECHNICAL ASSISTANCE TO DEPARTMENT OF PREVENTIVE AND SOCIAL MEDICINE OF GHANA MEDICAL SCHOOL TO DISSEMINATE FINDINGS FROM DANFA HEALTH PROJECT. MECHANISM IS ESTABLISHED FOR SYSTEMATICALLY EXCHANGING INFORMATION AND EXPERIENCE WITH MINISTRY OF HEALTH (MOH), MINISTRY OF ECONOMIC PLANNING, NATIONAL FAMILY PLANNING (NFP) COUNCIL, AND OTHER GOG AGENCIES TO STRENGTHEN GENERAL HEALTH SERVICES AND IMPLEMENT FP SERVICES. RECORDS RESEARCH AND EVALUATION ASPECTS OF PROJECT COULD FORM PART OF NATIONAL PROGRAM PLANNING AND EVALUATION EFFORT. RESEARCH AND APPLIED PROGRAMS ARE COORDINATED WITH SYSTEMATIC FLOW AND FEEDBACK OF INFORMATION BY MAINTAINING FORMAL LINKS WITH MOH AND NATIONAL FP PROGRAM AT ALL LEVELS. BY CONDUCTING WORKSHOPS WITH PERSONNEL OF OPERATING AGENCIES, AND BY ESTABLISHING PRIORITY OF STUDIES AND RESOURCE NEEDS. FINDINGS OF OPERATIONAL AND EPIDEMIOLOGICAL INVESTIGATIONS ARE DISSEMINATED RAPIDLY TO INTERESTED PERSONS AND ORGANIZATIONS THROUGH REGULAR PUBLICATIONS. DANFA PROJECT INFORMATION UNIT IS ESTABLISHED TO WRITE AND DISTRIBUTE RESEARCH PAPERS WITHIN GHANA. ITS STAFF IS TRAINED IN WRITING, DISTRIBUTION OF REPORTS; RESEARCH STAFF LEARNS ANALYSIS AND INTERPRETATION OF DATA. MANUALS ARE DEVELOPED DESCRIBING OPERATING PROCEDURES AND COMPONENTS OF ALTERNATIVE MODELS FOR DELIVERY OF DECENTRALIZED, GENERALIZED RURAL HEALTH SERVICES, INCLUDING FP, HORIZONTAL AND VERTICAL FLOW OF INFORMATION IS CONTINUOUS WITH PROFESSIONAL MEETINGS, FORMAL AND INFORMAL LINKS WITH MOH, INTERNATIONAL PLANNED PARENTHOOD FEDERATION, 2 INTERNATIONAL CONFERENCES ARE PLANNED TO SHARE IDEAS. MOH, JOINT-UNEP PLANS USE IMPROVED LOW COST SYSTEMS AND PROCEDURES OBTAIN FROM DANFA RESEARCH. UCLA PROVIDES SYSTEMS ANALYST, AND GOG SUPPLIES STAFF, TRAINING, LOCAL COSTS.

SCALE:

ENABLE THE GOVERNMENT OF GHANA (GOG) TO EXTEND AND IMPROVE RURAL HEALTH AND FAMILY PLANNING (FP) SERVICES IN A NATIONAL MANNER.

PURPOSE: TRANSFER OF INFORMATION DERIVED FROM PROJECT ACTIVITIES TO RELEVANT GOG AGENCIES ON AN ONGOING BASIS.

OUTPUTS:

1. COORDINATED RESEARCH AND APPLIED PROGRAMS WITH SYSTEMATIC FLOW AND FEEDBACK OF INFORMATION; LINKS BETWEEN MINISTRY OF HEALTH AND NATIONAL FP PROGRAM, WORKSHOPS, PRIORITIES. 2. ESTABLISHED DANFA PROJECT INFORMATION UNIT RESPONSIBLE FOR WRITING, EDITING AND DISTRIBUTING RESEARCH PAPERS AND WORKSHOPS WITHIN GHANA. 3. PRODUCTION OF WORKSHOPS, PROFESSIONAL ARTICLES, BOOK CHAPTERS, OPERATIONAL PLANNING GUIDES, TECHNICAL REPORTS, ETC., RELATIVE TO DANFA PROJECT EXPERIENCE.

COUNTRY/SUBJECT: GHANA PROJECT: 641804 SUB-PROJECT: 02
 TITLE: POPULATION PROGRAM SUPPORT INITIAL FYI 71 FINAL FYI 71

PROBLEM: WHILE GHANA HAS SUCCEEDED IN IMPLEMENTING A NATIONAL FAMILY PLANNING PROGRAM, ITS GEOGRAPHIC COVERAGE REMAINS THIN. FPC HEALTH/FAMILY PLANNING SERVICES ARE CURRENTLY AVAILABLE FOR ITS 700 RURAL POPULATION. GOG LACKS SUFFICIENT MEDICAL, PARAMEDICAL AND MANAGEMENT PERSONNEL WITH FAMILY PLANNING PROGRAM TRAINING OR EXPERIENCE TO EFFECTIVELY IMPLEMENT A WIDE-REACHING PROGRAM.

STRATEGY: THREE-YEAR PROJECT CONSISTS OF GRANT, TECHNICAL ADVISORY ASSISTANCE AND PARTICIPANT TRAINING TO STRENGTHEN AND EXPAND GHANA'S NATIONAL FAMILY PLANNING PROGRAM. USAID ALSO PROVIDES CONTRACEPTIVE SUPPLIES. HOST-COUNTRY PROVIDES INSTITUTIONAL SUPPORT AND LONG-TERM MAINTENANCE. OTHER DONORS INCLUDE GREAT BRITAIN, CANADA, FORD FOUNDATION, POPULATION COUNCIL, IPPF (INTERNATIONAL PLANNED PARENTHOOD FEDERATION) AND UNFPA (UNITED NATIONS FUND FOR POPULATION ACTIVITIES).

SUMMARY: GRANT, TECH ADVISORY ASSISTANCE, PARTICIPANT TRNG & COMMODITIES ARE PROVIDED TO STRENGTHEN AND EXPAND GHANA'S NATL FAMILY PLANNING PROGRAM (NFPD). TWO RURAL PILOT PROGRAMS CONSISTING OF COMMUNITY-BASED DELIVERY OF INTEGRATED HEALTH & FAMILY PLANNING SERVICES AND A DISTINCT COMMERCIAL CONTRACEPTIVE DISTRIBUTION PROGRAM WILL BE IMPLEMENTED. SHORT-TERM CONSULTANTS WILL ASSIST IN SYSTEMS DESIGN, CONTRACEPTIVE DISTRIBUTION AND IN DEVELOPMENT OF IN-SERVICE TRAINING PROGRAMS AND CURRICULA. PARTICIPANT TRNG WILL BE PROVIDED IN FAMILY PLANNING TRNG, MOTIVATIONAL RESEARCH, PLANNING & MANAGEMENT, & PRIVATE VOLUNTARY ORGANIZATIONS - PLANNED PARENTHOOD ASSOC OF GHANA AND COMMITTEE FOR CHRISTIAN MARRIAGE & FAMILY LIFE WILL ADMINISTER RURAL OUTREACH PROGRAM. TOTAL OF 40 STATIC CLINICS, 70 SATELLITE CLINICS AND 170 MOBILE SERVICE & CONTRACEPTIVE SUPPLY UNITS WILL BE PLACED IN OPERATION IN VOLTA & IN GHANA'S EASTERN REGION. PHYSICIANS, MIDWIVES, COMMUNITY HEALTH NURSES, FAMILY PLNGNG FIELD WORKERS AND VILLAGE VOLUNTEERS WILL RECEIVE SHORT-TERM TRNG IN INFORMATIONAL & EDUCATIONAL ASPECTS OF FAMILY PLNGNG AND IN DISPENSING OF CONTRACEPTIVES. TRNG PROGRAM WILL UTILIZE EXISTING INSTITUTIONS, FACILITIES AND PERSONNEL. COMMERCIAL CONTRACEPTIVES DISTRIBUTION SYSTEM WILL BE TESTED IN THE RURAL UPPER & NORTHERN REGIONS. THIS PROGRAM WILL PARALLEL AND BE SUPPORTED BY CENTRALLY FUNDED DISTRIBUTION PROGRAM AIMED AT URBAN AREAS. TRAINING INSTITUTE IS PROPOSED IN COOPERATION WITH THE MINISTRY OF HEALTH (MOH) TO PROVIDE BASIC MOTHER CHILD HEALTH/FAMILY PLNGNG TRAINING. INSTITUTE WILL ALSO TRAIN NFPD SUPERVISORY PERSONNEL IN CONCEPTS OF PLANNING AND MANAGEMENT. GOG WILL FINANCE INSTITUTE'S CONSTRUCTION. OTHER NFPD EFFORTS WILL INCLUDE DEVELOPMENT OF MANAGEMENT INFORMATION SYSTEM AND FAMILY PLNGNG RESEARCH. USAID WILL ALSO SUPPLY CONTRACEPTIVES. HOST-COUNTRY PROVIDES FINANCIAL AND INSTITUTIONAL SUPPORT. PRIMARY BENEFICIARIES ARE NFPD PERSONNEL.

GOALS: IMPROVE FAMILY WELFARE THROUGH FAMILY PLANNING AND TO SLOW SIGNIFICANTLY THE RATE OF POPULATION GROWTH IN GHANA IN ORDER TO ENHANCE THE CAPACITY OF THE NATION TO PROVIDE FOR ECONOMIC DEVELOPMENT AND AN IMPROVED QUALITY OF LIFE.

PURPOSE: DEVELOP THE PRIMARY SYSTEMS OF A FAMILY PLANNING PROGRAM CAPABLE OF ACHIEVING THE GOALS OF THE NATIONAL POPULATION POLICY.

OUTPUTS: 1. COMMUNITY-BASED MODEL SATELLITE FAMILY PLNGNG DELIVERY PROGRAMS TESTED & OPERATING IN 2 REGIONS. 2. NATL COMMERCIAL DISTRIBUTION PROGRAM STRENGTHENED TO PROVIDE CONTINUOUS AVAILABILITY OF LOW COST NON-PRESCRIPTION CONTRACEPTIVES WITH POINT-OF-SALE PROMOTION IN ALL COMMUNITIES WITH POPULATION OVER 5,000. 3. PILOT RURAL CONTRACEPTIVE DISTRIBUTION PROG FULLY TESTED IN 2 REGIONS. 4. IN-SERVICE TRNG PROGRAM ESTABLISHED FOR ALL NFPD (NATL FAMILY PLNGNG PROG) SUPERVISORY PERSONNEL. 5. NFPD MANAGEMENT INFORMATION SYSTEM INSTITUTED. 6. TRAINING INSTITUTE BUILT AND PROVIDING IN-SERVICE TRNG TO ALL NFPD SERVICE PERSONNEL. 7. FAMILY PLNGNG INTEGRATED WITH MOTHER/CHILD/MLTM SERVICES IN ALL MINISTRY OF HEALTH PROGS.

COUNTRY/SUBJECT: GHANA PROJECT: 641806 SUB-PROJECT: 06
 TITLE: ECONOMIC DEVELOPMENT MANAGEMENT INITIAL FYI 71 FINAL FYI 79

PROBLEM: BECAUSE GHANA'S CIVIL SERVICE LACKS AN EFFICIENT TRAINING SYSTEM, THE GHANEAN ADMINISTRATORS LACK THE MANAGEMENT SKILLS NEEDED TO MEET RAPID TECHNOLOGICAL CHANGE.

STRATEGY: LONG TERM APPROACH IN PUBLIC SECTOR.

SUMMARY: TECHNICAL ASSISTANCE (TA) TO GHANA (GOG) PROVIDES SPECIAL MANPOWER TRAINING IN ECONOMICS, TAXATION, MANAGEMENT OF INDUSTRIAL DEVELOPMENT, STATISTICS, PUBLIC ADMINISTRATION AND CUSTOMS ADMINISTRATION. PROJECT IMPROVES GOG'S CAPACITY TO GENERATE AND MANAGE DOMESTIC RESOURCES, IMPROVES THE GNP AND EMPLOYMENT LEVEL AND MAKES BETTER USE OF THE RESOURCES OF THE PRIVATE SECTOR. GOG PROVIDES TRAVEL COSTS AND SALARIES OF IN-TRAINING PARTICIPANTS AND AGREES TO EMPLOY RETURNING PARTICIPANTS IN APPROPRIATE POSITIONS FOR AT LEAST TWO YEARS. PARTICIPANTS ARE TRAINED IN DEVELOPMENT MANAGEMENT AND ALLOCATION OF ECONOMIC RESOURCES IN: ECONOMICS/STATISTICS, DEVELOPMENT ECONOMICS, TAX THEORY, POLICY AND ADMIN, AGR DEVEL MANAGEMENT, EXPORT PROMOTION AND DEVEL, DEVEL ADMIN, PROJECT EVALUATION, PLANNING AND DEVELOPMENT RESOURCE ALLOCATION, & SPECIFIC CONTRACTOR WORKS WITH GHANEAN REPRESENTATIVES IN EACH OF THE ABOVE AREAS.

GOALS: DEVELOP BETTER MANAGEMENT AND ECONOMIC POLICIES RELATED TO GHANA'S GROWTH.

PURPOSE: UPGRADE THE DECISION-MAKING AND MANAGEMENT CAPACITY OF VARIOUS GOG INSTITUTIONS ENGAGED IN MAKING AND IMPLEMENTING MACRO-ECONOMIC POLICIES.

OUTPUTS: TOP AND MID-LEVEL SERVANTS TRAINED IN THE FIELDS OF ECONOMICS/STATISTICS, DEVELOPMENT ECONOMICS, TAX THEORY, POLICY AND ADMINISTRATION, AGR DEVELOPMENT MANAGEMENT, AGR-INDUSTRIAL DEVELOPMENT MANAGEMENT, EXPORT PROMOTION AND DEVELOPMENT, DEVELOPMENT ADMINISTRATION, PROJECT EVALUATION, PLANNING AND DEVELOPMENT RESOURCE ALLOCATION.

PROBLEM: THE GOVT OF GHANA (GOG) WILL NO LONGER HAVE FAMILY PLANNING (FP) SUPPLIES (CONTRACEPTIVES AND CLINICAL EQUIPMENT) MADE AVAILABLE BY THE INTERNATIONAL PLANNED PARENTHOOD ASSOCIATION (IPPA). BECAUSE THE GOG DOES NOT HAVE SUFFICIENT PP SUPPLIES OR AN EFFICIENT METHOD FOR MANAGING THE FLOW OF ORDERED SUPPLIES, GOG IS NOT ABLE TO EQUIP ITS PP CLINICS ADEQUATELY, INCREASE THE NUMBER OF ACCEPTORS AND THUS NOT ABLE TO MEET ITS GOALS FOR POPULATION RATE REDUCTION.

STRATEGY: 3-YEAR PROJECT CONSISTS OF GRANT TO GOVT OF GHANA (GOG) TO FINANCE CONTRACEPTIVE SUPPLIES AND EQUIPMENT FOR A SUPPLY-MGMT CONSULTANT. USGID FUNDS WILL COVER REQUIREMENTS FOR 1971-73; 2/3 OF 1974; 1/3 OF 1975; SUPPLIES, MGMT CONSULTANT, COUNTERPART LOCAL CURRENCY FUNDS, EITHER DONOR OR FROM FOUNDATION OF GHANA PROVIDES THE THIRD PART CONTRACEPTIVES & ASSOCIATED CLINICAL EQUIP IN 1973-74, 2/3 IN 1974 AND ENTIRE CURRENCY REQUIREMENTS IN 1975/76. PROVS SPACE, STAFF, TRANSPORT.

SUMMARY:

GRANT PROVIDED TO THE GOVT OF GHANA (GOG) TO HELP FINANCE THE NATIONAL FAMILY PLANNING PROGRAM'S (NFP) SUPPLIES OF CONTRACEPTIVES AND CLINICAL EQUIPMENT AND PROVIDE THE SERVICES OF A SUPPLIES MANAGEMENT CONSULTANT. PROJECT FOCUSES ON ESTABLISHING PROCEDURES FOR INSURING AN EVEN, EFFICIENTLY-MANAGED FLOW OF PP SUPPLIES INTO GHANIAN WAREHOUSES, CLINICS AND OUTLETS TO ULTIMATE USERS. NFP WILL ESTABLISH A DISTRIBUTION NETWORK OF PP COMMODITIES AND SERVICES THROUGH ITS CLINICS. THIS SYSTEM INCLUDES COUPON BOOKLETS FOR PILL-USERS PROVIDED AT CLINICS AND DRUG SELLERS; DISTRIBUTION OF LOW-PRICE CONTRACEPTIVES AND AN NFP PILOT DISTRIBUTION TO 100 OUTLETS DURING THE 1ST HALF OF 1971. IF THE PILOT PHASE IS SUCCESSFUL, PROGRAM ENVISIONS 2000 OUTLETS BY THE END OF 1971. NFP WILL ALSO SET UP A SUPPLIES SYSTEM IN THE MEDICAL STORES UNIT OF THE MINISTRY OF HEALTH (MOH) FOR STORAGE AND TRANSPORT. 3-MONTH SUPPLY WILL BE MAINTAINED IN THE CENTRAL-REGIONAL STORAGE FACILITY AND ANOTHER 3-MONTH SUPPLY IN GOVT CLINICS. STOCKS OF CONDOMS AND FOAM KITS IN PRIVATE OUTLETS WILL BE PROVIDED IN ADDITION TO THE ABOVE (A) SUPPLY. NFP IS TO ESTABLISH A CYCLE OF ESTIMATING AND ORDERING SUPPLIES WHICH RESULTS IN A NORMAL ANNUAL CYCLE OF 2 FIRM ORDERS AND 4 DELIVERIES OF AID-FINANCED SUPPLIES PER YEAR. RE-ESTIMATES ON ORDERS, BASED ON NUMBER OF PP CLINICS AND OUTLETS ESTAB AND USED ANNUALLY, ARE DUE TWICE A YEAR AT SET DATES. NFP WILL PROVIDE STATISTICS ON THE NUMBERS OF ATTENDEES AT PP CLINICS; NEW VERSUS CONTINUING ACCEPTORS; SUPPLIES MOVED FROM VARIOUS STORAGE FACILITIES; STOCKS/SUPPLIES ON ORDER FROM OTHER SOURCES; AND LIST NET-GOBS ADOPTED BY NEW ACCEPTORS. NFP WOULD LIKE TO ESTABLISH PP CLINICS IN 100 MLTH CNTRS BY 1972; INCREASE CONTRACEPTIVE OUTLETS TO 5000 IN 1972, AND TRAIN 30 NURSES AS INSPECTORS, AND 80 PP AUXILIARIES AS CLINIC ADMINISTRATORS. BENEFICIARIES WILL BE GHANA'S PP PERSONNEL AND THE FERTILE-AGE POPULATION. NFP WILL IMPLEMENT THE PROJ. USGID WILL FINANCE ALL CONTRACEPTIVE CLINICAL REQUIREMENTS IN 1971-73; 2/3 OF NFP'S 1974 REQUIREMENTS, AND 1/3 OF 1975'S BEFORE PHASING OUT ALSO THE CONSULTANT AND TRNG. GOG GRACUALLY ASSUMES PP COSTS

SCALE: GHANA'S POPULATION GROWTH RATE REDUCED. 1

PURPOSE: FAMILY PLANNING (FP) SUPPLIES MADE MORE WIDELY AVAILABLE IN GHANA. 1

OUTPUTS: 1. PP COMMODITIES AND SERVICES DISTRIBUTED THROUGH PP CLINICS. 2. NATIONAL FAMILY PLANNING PROGRAM SUPPLIES SYSTEM SET UP IN THE MEDICAL STORES UNIT OF THE MINISTRY OF HEALTH (MOH) FOR STORAGE AND TRANSPORT; 3. 3-MONTH SUPPLY MAINTAINED IN CENTRAL-REGIONAL STORAGE. 4. 3-MONTH SUPPLY MAINTAINED IN GOVT CLINICS. 5. PRIVATE OUTLETS; STOCKS OF CONDOMS AND FOAM KITS ADDED TO ABOVE (A) SUPPLIES. 6. CYCLE OF ESTIMATING AND ORDERING SUPPLIES ESTABLISHED. 7. NORMAL ANNUAL CYCLE ESTABLISHED TO INCLUDE 2 FIRM ORDERS AND 4 DELIVERIES OF AID-FINANCED SUPPLIES PER YEAR. 8. STATISTICS FOR ORDERING PROVIDED ON NUMBER OF CLINIC ATTENDEES; NEW/CONTINUING ACCEPTORS; NET-GOBS ADOPTED. ORAL USERS; SUPPLIES MOVED FROM STORAGE. 1

PROBLEM: ONE OVERALL CONSTRAINT WHICH MUST BE OVERCOME BEFORE AGRICULTURAL PRODUCTION OF GHANAIAN SMALL-SCALE FARMER CAN BE SIGNIFICANTLY INCREASED IS LACK OF COORDINATED EFFORT ON PART OF INSTITUTIONS SERVING FARMERS TO PROVIDE AGRICULTURAL INPUTS AND SERVICES TO LARGE NUMBERS OF SMALL-SCALE FARMERS ON A REGULAR AND TIMELY BASIS. ALSO, THERE IS INSUFFICIENT ACCESS TO CREDIT, FERTILIZER, IMPROVED SEEDS, MARKETING, APPLIED RESEARCH, EXTENSION SERVICES AND INTERMEDIATE TECHNOLOGY.

STRATEGY: LOAN AND GRANT FUNDS WILL BE PROVIDED TO IMPORT FERTILIZER, PROJECT SUPPORT COMMODITIES, SMALL FARM EQUIPMENT AND RAW MATERIALS REQUIRED FOR LOCAL MANUFACTURE OF INTERMEDIATE TECHNOLOGIES. SALE OF THESE IMPORT ITEMS WILL GENERATE EQUIVALENT AMOUNT LOCAL CURRENCY, WHICH WILL BE CHANNELLED TO AGRICULTURAL DEVELOPMENT BANK (ADB) TO FINANCE AN INCREMENTAL WORKING CAPITAL REQUIREMENTS OF ITS EXPANDED SMALL FARMER CREDIT OPERATIONS.

SUMMARY: PROJECT CONSISTS OF 4 BASIC COMPONENTS: CREDIT EXPANSION, FERTILIZER PROCUREMENT, PROCESSING AND DISTRIBUTION, SEED MULTIPLICATION, SMALL FARM SYSTEMS RESEARCH, MARKETING AND DEMONSTRATION/EXTENSION INCLUDING APPROPRIATE EMPHASIS ON ROLE OF WOMEN. THEREFORE, IMPACT ON SMALL FARMERS WILL BE OF BROAD NATURE. OUTPUTS OF FERTILIZER AND SEED MULTIPLICATION COMPONENTS WILL BE MADE ACCESSIBLE TO AS MANY FARMERS AS POSSIBLE. CREDIT COMPONENT WILL PROVIDE FUNDS TO SMALL FARMERS CULTIVATING 10 ACRES OR LESS SO THEY WILL BE ABLE TO PURCHASE THESE INPUTS. EXTENSION/DEMONSTRATION COMPONENT WILL BE ORIENTED TOWARDS SMALL FARMER. MTO/RESEARCH COMPONENTS WILL BE ORIENTED TO SMALL FARMER BUT ON EXPERIMENTAL BASIS IN LIMITED AREAS.

SCALE: INCREASE AGRICULTURAL PRODUCTION ON SMALL HOLDINGS, LEADING TO HIGHER LEVELS OF INCOME AND WELFARE FOR SMALL FARMERS IN GHANA.

PURPOSE: DEVELOP AN INSTITUTIONALIZED COORDINATED SYSTEM TO PROVIDE IMPROVED AGRICULTURAL INPUTS AND SERVICES TO SMALL FARMERS ON A TIMELY BASIS, PARTICULARLY IN AREAS SERVED BY AGRICULTURAL DEVELOPMENT BANK'S RURAL LOAN OFFICE.

OUTPUTS: 1. FERTILIZER DISTRIBUTION SYSTEM OPERATING NATIONWIDE. 2. IMPROVED SEED DISTRIBUTION SYSTEM OPERATING NATIONWIDE. 3. EFFICIENT SMALL FARMER CREDIT PROGRAM OPERATING NATIONWIDE. 4. SMALL FARM SYSTEMS RESEARCH CAPABILITY INSTITUTED. 5. UNDERSTANDING OF FUNCTIONING OF FOOD CROP MTO SYSTEM AND EXPERIENCE WITH OTHER APPROACHES TO TRADITIONAL MTO CHANNELS. 6. EXTENSION SYSTEM IMPROVED TO DEMONSTRATE PROFITABILITY OF USING BETTER FARM PRACTICES. 7. EFFICIENT COORDINATED MTO INSTITS.

PROBLEM: AGRICULTURE IN THE UPPER REGION OF GHANA (SAVANNAH ZONE) CONSISTS ALMOST ENTIRELY OF SMALL FARM VENTURES (2-10 ACRES), CULTIVATED WITH HAND TOOLS; USUAL YIELDS ARE BARELY SUFFICIENT FOR SURVIVAL. THE DROUGHT (1966-72) CAUSED NEAR TOTAL CROP FAILURE IN SCATTERED AREAS AND RESULTED IN WIDESPREAD MALNUTRITION AND DISEASE. ALTHOUGH THE GOVERNMENT OF GHANA HAS BEGUN AN INTEGRATED PROGRAM TO IMPROVE HEALTH, NUTRITION, AND AGRICULTURAL OUTPUT IN THIS REGION, IT REQUIRES ADDITIONAL FINANCIAL INPUT TO MAKE SIGNIFICANT CHANGES.

STRATEGY: TWO-YEAR GRANT TO THE GOVERNMENT OF GHANA (1968) WILL SUPPORT COORDINATED EFFORTS OF GOV., CATHOLIC RELIEF SERVICE, AND CHRISTIAN SERVICE COMMISSION TO IMPROVE NUTRITION, HEALTH, AND AGRICULTURAL PRODUCTIVITY IN THE SUB-SAVANNAH AREA. GRANT WILL SUPPORT OPERATIONAL COSTS OF GOV NUTRITION PROGRAM, PROCUREMENT OF VEHICLES, MEDICAL EQUIPMENT, AND VACCINES.

SUMMARY: GRANT TO THE GOVERNMENT OF GHANA WILL ASSIST THE APPROPRIATE MINISTRIES AND INVOLVED PRIVATE VOLUNTARY ORGANIZATIONS (PVO'S) TO IMPROVE LEVELS OF HEALTH, NUTRITION, AND AGRICULTURAL PRODUCTION IN THE DROUGHT-AFFECTED UPPER REGION (SUB-SAVANNAH AREA) OF THAT NATION. TO PROMOTE AGRICULTURAL PRODUCTION, GRANT WILL MAKE APPROXIMATELY 1000 BULLOCK PLOWS AVAILABLE FOR SALE THROUGH FLOWING TRAINING CENTERS OPERATED BY THE MINISTRY OF AGRICULTURE (MOA), THE CATHOLIC RELIEF SERVICE (CRS) AND THE CHRISTIAN SERVICE COMMISSION (CSC). FUNDS FROM MOA SALES WILL BE USED FOR SMALL DEVELOPMENT ACTIVITIES IN THE REGION, AS JOINTLY AGREED UPON BY MOA AND USAID; POSSIBLE ACTIVITIES INCLUDE REFORESTATION, WELLS, SMALL DAMS, ETC. PVO SALES PROCEEDS WILL GO INTO TWO REVOLVING FUNDS, MANAGED SEPARATELY BY CSC AND CRS. THESE FUNDS WILL BE USED FOR PURCHASE AND SUBSEQUENT RESALE OF PLOWS, PARTS, AND OTHER INPUTS. GRANT FUNDS WILL BE MADE AVAILABLE TO CSC AND CRS FOR PURCHASE OF CEMENT WHICH WILL BE RESOLD THROUGH THEIR RETAIL OUTLETS AND USED FOR WELL AND SANITARY SILO CONSTRUCTION; PROCEEDS WILL RETURN TO REVOLVING FUNDS. SIMILARLY, JUTE SACKS FOR STORAGE AND TRANSPORT OF PRODUCE WILL BE MADE AVAILABLE FOR RESALE. IN SUPPORT OF GOV MASS VACCINATION PROGRAM, GRANT WILL PROVIDE 3 VEHICLES, SPARE PARTS, AND OPERATING EXPENSES; VACCINATION EQUIPMENT (PES-3-JETS); REFRIGERATION EQUIPMENT; AND VACCINES (TB, DPT, POLIO, MEASLES, AND MENINGITIS), USING 7 IMMUNIZATION TEAMS AND 11 EXISTING MATERNAL/CHILD HEALTH CENTERS. GOV WILL IMMUNIZE 220K CHILDREN (AGES 5 AND UNDER) OVER A 2 YEAR PERIOD. GRANT WILL ALSO PARTIALLY SUPPORT OPERATIONAL COSTS OF BANKO NUTRITION CENTER. WITH THIS SUPPORT, BANKO WILL CONTINUE TO OPERATE THREE MOBILE TEAMS WHICH SERVE 14 STATIONS THROUGHOUT THE REGION; TO PROVIDE WEEKLY OR FORTNIGHTLY CHILD WELFARE CLINICS REACHING 1200 CHILDREN PER WEEK; TO PROVIDE NUTRITION EDUCATION AND FOOD DISTRIBUTION; AND TO OPERATE A NUTRITION REHABILITATION CENTER WHICH PROVIDES INTENSIVE CARE TO SOME 400 CHILDREN ANNUALLY. GRANT ALSO SUPPORTS TRAINING OF STAFF FOR TWO NEW NUTRITION CENTERS, NUTR TRAINING OF AGR/HEALTH WORKERS, AND EXPANDED EXTENSION SVC.

GOALS: ECONOMIC AND SOCIAL GROWTH PROMOTED IN THE DROUGHT-AFFECTED DISTRICTS OF THE UPPER REGION OF GHANA. **PURPOSE:** TO STIMULATE THE RECOVERY AND REHABILITATION OF THE RURAL POPULATION AFFECTED BY DROUGHT IN THE UPPER REGION, REDUCING THEIR VULNERABILITY TO THEIR HARSH ENVIRONMENT, ENABLING THEM TO BETTER COPE WITH SUBSEQUENT YEARS OF POOR CROPS, THUS FORESTALLING FUTURE EMERGENCY SITUATIONS.

OUTPUTS: 1. BULLOCK PLOWING ADOPTED BY 1000 FARMERS. 2. 500 SILOS CONSTRUCTED. 3. 220,000 CHILDREN UNDER THE AGE OF 5 VACCINATED AGAINST COMMUNICABLE DISEASE. 4. 70 GHANESE NUTRITION WORKERS TRAINED. 5. PLOW, CEMENT, JUTE SACKS & CARTS DISTRIBUTED TO SMALL FARMERS. 6. NUTRITION PROGRAM SUPPORTED WITH INCREASED STAFF TRAINED AND EXPANDED SERVICES MADE AVAILABLE.

PROBLEM: EVEN THOUGH JOBS ARE AVAILABLE, UNEMPLOYMENT IS A SERIOUS PROBLEM IN GHANA. MANY PEOPLE IN JOB MARKET LACK TECHNICAL SKILLS FOR INDUSTRIAL EMPLOYMENT. THE ACCRA AREA LACKS EFFECTIVE INSTITUTIONS TO PROVIDE SCHOOL GRADUATES WITH VOCATIONAL SKILLS THEY NEED TO GET JOBS.

STRATEGY: LONG-TERM APPROACH DEVELOPS NEW INSTITUTION.

SUMMARY: OPPORTUNITIES INDUSTRIALIZATION CENTER (OIC) CONTRACTED TO DEVELOP COMMUNITY-BASED AND SELF-STARTED COUNTERPART ORGANIZATION IN GHANA (OIC/O) WITH CAPACITY TO PROVIDE VOCATIONAL TRAINING FOR UNEMPLOYED. PILOT EFFORT ESTABLISHES CENTER IN ACCRA, FOCUSING INITIALLY ON URBAN GRADUATES, BUT LATER EXPANDING TO REACH OTHER UNEMPLOYED. TRAINING HAS 3 COMPONENTS. PRE-VOCATIONAL (FEEDER) ELEMENT PROVIDES BASIC EDUCATION IN COMMUNICATIONS, READING, COMPUTATION, HISTORY TO PREPARE TRAINEE FOR VOCATIONAL ELEMENT. CENTER FAMILIARIZES TRAINEE WITH ATTITUDES AND RESPONSIBILITIES OF SUCCESSFUL EMPLOYEE THROUGH WEEKLY COUNSELING, EVALUATION. SUBSEQUENT VOCATIONAL TRAINING PROGRAM PREPARES TRAINEE FOR ENTRY LEVEL JOB IN AUTO MECHANICS, SECRETARIAL, ELECTRONICS, MASONRY, PLUMBING, CARPENTRY, OR ELECTRICITY. EMPLOYERS MAY IDENTIFY TRAINEES FROM FEEDER COMPONENT FOR ON-JOB TRAINING. CENTER ULTIMATELY TRAINS 200 STUDENTS IN 12-18 MONTHS, PLACES THEM IN JOBS RELATED TO TRAINING, AND PROVIDES FOLLOW-UP TO ENSURE EFFECTIVENESS. OUTREACH UPDATES SKILLS OF EMPLOYEES WHO NEED FURTHER TRAINING. TRAINEES PERFORM AT SAME LEVEL AS THOSE FROM 3-4 YEAR VOCATIONAL SCHOOL. JOB DEVELOPMENT SPECIALIST LOCATES JOB OPPORTUNITIES IN PRIVATE AND PUBLIC SECTORS, ANALYZES LABOR TRENDS, AND RESEARCHES LOCAL ECONOMY. OIC PROVIDES 10 TECHNICIANS WHO ARE GRADUALLY PHASED OUT, TRANSFERRING OPERATIONAL AND MANAGERIAL CONTROL TO OIC/O. YEARLY IN-SERVICE TRAINING UPDATES LOCAL STAFF, SOME MEMBERS OF WHICH RECEIVE TRAINING AT OIC HEADQUARTERS IN US. LOCAL FUND-RISING GENERATES PROPORTION OF OIC/O BUDGET, BUT SUPPLEMENTARY SUPPORT FROM GOVERNMENT OF GHANA IS REQUIRED FOR PERMANENT VIABILITY. ENTREPRENEURIAL AND MANAGEMENT DEPARTMENT CONDUCTED BUSINESS DEVELOPMENT COURSES, BUT RECEIVED NO USAID FUNDING.

GOALS: CONTRIBUTE TO THE REDUCTION OF UNEMPLOYMENT AND UNDEREMPLOYMENT IN THE ACCRA-TEMA AREA INITIALLY. **PURPOSE:** DEVELOP A PROTOTYPE VOCATIONAL TRAINING PROGRAM IN THE ACCRA-TEMA AREA THAT MIGHT BE REPRODUCED IN OTHER COMMUNITIES. OPPORTUNITIES INDUSTRIALIZATION CENTER/OIC.

OUTPUTS: 1. OPERATING OIC VOCATIONAL TRAINING PROGRAM WITH CURRICULA FOR FEEDER, VOCATIONAL COURSES; IN-SERVICE TRAINING; ACADEMIC, FINANCIAL RECORDS SYSTEMS; EVALUATION AND RESEARCH CAPABILITIES; MODERN TRAINING TECHNIQUES; ACCEPTABLE RATE OF COMPLETIONS; JOB PLACEMENTS, CERTIFICATIONS; JOB PLACEMENT, COUNSELING, FOLLOW-UP SERVICES. 2. LEVEL OF COMMUNITY CONSCIOUSNESS, WILLINGNESS TO SUPPORT PROJECT MORALLY, FINANCIALLY. 3. OPERATING OUTREACH SERVICE. 4. ACTIVE ENTREPRENEURIAL MIND SERVICES.

PROJECT: 6410072 SUB-PROJECT: 00
 COUNTRY/BUREAU: GHANA
 TITLE: FARMERS' ASSN AND AGRIBUSINESS-PAAD (PVOS) INITIAL FYI 77 FINAL FYI 80

PROBLEM: 70% OF GHANA'S POPULATION LIVES IN RURAL AREAS. HOWEVER, THEIR INCOMES ARE LOWER AND THEY HAVE LESS ACCESS TO SOCIAL SERVICES THAN URBAN DWELLERS. IN ADDITION, SMALL SCALE FARMING IS CONSIDERED TO BE LOW STATUS OCCUPATION. CONSEQUENTLY, RURAL MIGRATION TO CITIES HAS BECOME SERIOUS PROBLEM. GOVERNMENT PROGRAMS FOR RURAL POPULATION HAVE TOO LITTLE STAFF, TOO LITTLE MONEY TO PROVIDE INFORMATION, INPUTS, SERVICES. LARGE NUMBER OF PRIVATE EXTRA-GOVT CHANNELS EXIST, BUT THIS SOURCE OF ACTION PROGRAMS, METHODOLOGIES IS NOT FULLY EXPLOITED.

STRATEGY: 3-YEAR PROGRAM CONSISTING OF GRANTS TO ELIGIBLE PRIVATE VOLUNTARY ORGANIZATIONS (PVOS) TO ENCOURAGE ORGANIZATION OF SMALL FARMERS AND CREATION OF SMALL-SCALE AGRIBUSINESS. PVOS PROVIDE ABOUT 20% OF SUBPROJECT COST.

SUMMARY: USAID PROVIDES GRANTS TO ELIGIBLE PVOS FOR APPROVED RURAL DEVELOPMENT SUBPROJECTS IN GHANA AND ESTABLISHES FUNDING AND EVALUATION PROCESS FOR GHANESE AND US PVOS TO CREATE OR STRENGTHEN SMALL FARMER ASSOCIATIONS (AGRICULTURAL CREDIT, VILLAGE TRADE/CRAFT, COOPS, PRODUCTION/MARKETING) AND RURAL ENTERPRISES. SUBPROJECT DESIGN WILL BE DETERMINED BY PVOS WITH A FORMAL REVIEW AND EVALUATION MECHANISM ADMINISTERED BY USAID. SUBPROJECTS STRENGTHEN RURAL ACTION CAPABILITY OF PVOS AND RURAL POOR ULTIMATELY BENEFIT FROM INCREASED INCOME, EMPLOYMENT. THIS MAY ENCOURAGE PEOPLE TO REMAIN IN RURAL AREAS RATHER THAN MIGRATE TO CITIES. PRIOR TO GRANT, USAID REVIEWS PVOS RECORDS AND ADMINISTRATIVE SYSTEMS TO ASSURE THAT THEY MEET SATISFACTORY STANDARDS. PROPOSALS ARE EXAMINED BY USAID AND BY MINISTRY OF ECONOMIC PLANNING TO INSURE CONSISTENCY WITH POLICIES AND PROGRAM PRIORITIES. PVOS SUBPROJECTS OF UP TO 3 YEARS DURATION WORK TO: 1. ENCOURAGE GROUPS OF SMALL FARMERS TO FORM ASSOCIATIONS TO ACCOMPLISH OBJECTIVES IDENTIFIED BY FARMERS THEMSELVES; 2. ENCOURAGE SMALL- TO MEDIUM-SCALE, LABOR-INTENSIVE, RURAL ENTERPRISES USING INTERMEDIATE TECHNOLOGY. SUBPROJECTS ARE EVALUATED AT 3 LEVELS: ANNUAL FIELD SURVEYS AND SEMI-ANNUAL PROGRESS REPORTS BY PVOS, ANNUAL EVALUATION OF USAID WITH PVOS, AND IN-DEPTH OUTSIDE EVALUATION AT END OF SUBPROJECT. COST EFFECTIVENESS IS EXAMINED DURING COURSE OF EVALUATIONS. ELIGIBLE PVOS MUST ALREADY BE WORKING IN GHANA, HAVE SUBSTANTIAL EXPERIENCE IN RURAL DEVELOPMENT, AND PROVIDE 20% SUBPROJECT COST. IF COMMODITIES FINANCED BY USAID ARE SOLD, TOTAL PROCEEDS MUST BE TREATED AS REVOLVING FUND, WORKING CAPITAL ADVANCES TO ENTREPRENEURS AND FARMER GROUPS ARE ALSO REPAYED TO A REVOLVING FUND. USAID ASSIGNS PROJECT OFFICER TO REVIEW AND MONITOR PVOS PROJECTS CONTINUALLY.

GOAL: TO FOSTER IMPROVED AND MORE EQUITABLE DISTRIBUTION OF INCOMES, EXPANDED EMPLOYMENT OPPORTUNITIES, AND INCREASED WELL-BEING OF RURAL FARM AND NON-FARM, LOW-INCOME PEOPLE.

PURPOSE: TO SUPPORT PRIVATE AND VOLUNTARY INITIATIVES AND ACTION IN ORDER TO DETERMINE APPROPRIATE AND/OR OPTIMAL MEANS OF ACHIEVING WIDE-SCALE RURAL IMPROVEMENT THROUGH FARMER ASSOCIATIONS AND RURAL-BASED BUSINESS ENTERPRISES.

OUTPUTS: 1. NEW FARMER ASSOCIATIONS FORMED AND/OR STRENGTHENED IN ORDER TO ENCOURAGE: A. IMPROVED PRODUCTION AND MARKETING PRACTICES, MORE EFFICIENT ACQUISITION OF CREDIT, INPUTS, INFORMATION, ETC; AND/OR B. SOCIAL DEVELOPMENT IN FIELDS SUCH AS EDUCATION, HEALTH, NUTRITION, FAMILY PLANNING, ETC. 2. PRODUCTIVE ENTERPRISES PROVIDING INPUTS TO RURAL ACTIVITIES AND/OR MAKING USE OF AGRICULTURAL PRODUCE OF FARMER ASSOCIATIONS.

PROJECT: 6410077 SUB-PROJECT: 00
 COUNTRY/BUREAU: GHANA
 TITLE: ECONOMIC/RURAL DEVELOPMENT MANAGEMENT INITIAL FYI 77 FINAL FYI 81

PROBLEM: LACK OF DISTRICT LEVEL PLANNING, COORDINATION AND MANAGEMENT CAPABILITIES LIMIT THE AVAILABILITY OF SOCIAL SERVICES, PRODUCTION, INPUTS AND INFRASTRUCTURE REQUIRED FOR INCREASED RURAL AND SMALL FARMER PRODUCTIVITY. THIS IS REFLECTED IN THE LOW INCOME LEVELS, HIGH INFANT MORTALITY RATE SHORT LIFE EXPECTANCIES, UNDERNUTRITION AND MALNUTRITION.

STRATEGY: CAPITAL INTENSIVE, LONG TERM, PUBLIC SECTOR, DECENTRALIZED APPROACH.

SUMMARY: CAPITAL ASSISTANCE PROVIDED TO GOVERNMENT OF GHANA (GOG) TO STRENGTHEN ECONOMIC PLANNING AND COORDINATING CAPABILITIES AT DISTRICT AND VILLAGE LEVEL. IMPACT DIRECTED AT GOG GOAL OF INCREASED DEVELOPMENT IN RURAL AREAS THRU EFFECTIVE INVOLVEMENT OF RURAL PEOPLE. FOCUSES ON BETTER PLANNING AND COORDINATION OF DEVELOPMENT ACTIVITIES. THREE INSTITUTIONAL STRUCTURES CREATED TO SUPPORT DECENTRALIZATION. TEAMS OF GHANESE TRAINERS/CONSULTANTS ESTABLISHED IN THE NINE REGIONS OF THE COUNTRY. INCLUDES PERSON WITH EXPERIENCE IN ADMINISTRATION, REGIONAL PLANNING, AND ONE REPRESENTATIVE OF DECENTRALIZED MINISTRIES AT THE REGIONAL AND DISTRICT LEVELS; 2. CONDUCT ANNUAL TRAINING SEMINAR/WORKSHOPS IN PLANNING, COORDINATION AND MANAGEMENT SKILLS FOR THESE GROUPS; 3. CONTINUALLY ASSESS AND REDESIGN WORKSHOPS TO MEET LOCAL NEEDS. SEMINAR/WORKSHOPS WILL BE THREE WEEKS LONG. EACH REGION WILL HOLD SEMINARS FOR DISTRICT IN ITS AREA ON AN ANNUAL BASIS AND GENERATE A DISTRICT DEVELOPMENT PLAN. PROJECT COORDINATING COMMITTEE IS ESTABLISHED AT THE NATIONAL LEVEL TO PROVIDE POLICY GUIDANCE AND INTERMINISTERIAL COORDINATION. PROJECT SECRETARIAT IS PROVIDED BY THE MINISTRY OF ECONOMIC PLANNING AND WILL DIRECT PROJECT AS THE NATIONAL LEVEL. WILL SELECT REGIONAL TRAINERS, SUPERVISE PROGRAM DEVELOPMENT, MONITOR/EVALUATE PROGRAM AND PROVIDE LOGISTICS SUPPORT FOR TRAINERS. TRAINING SEMINARS HIGHLY APPLIED AND MANAGEMENT RELATED. GOG PROVIDES 50% OF PROJECT COSTS. CANADIAN INTERNATIONAL DEVELOPMENT AGENCY ASSISTS WITH IN-COUNTRY TRAINING (PROJECT PLANNING, PROGRAMMING, BUDGETING AND MONITORING). USAID PROVIDES TECHNICAL ADVISORS. DIRECT BENEFICIARIES ARE INDIVIDUALS IN RURAL ADMINISTRATIVE POSITIONS. SECONDARY BENEFICIARIES ARE THE RURAL POOR. AS RURAL REGIONAL DEVELOPMENT INCREASES AND EXPANDS THE AGRICULTURAL ECONOMIC BASE NEW EMPLOYMENT OPPORTUNITIES ARE CREATED IN SERVICES AND PROCESSING.

GOAL: INCREASED DEVELOPMENT OF THE RURAL AREAS THRU EFFECTIVE INVOLVEMENT OF RURAL PEOPLE IN THE DEVELOPMENT PROCESS.

PURPOSE: ESTABLISH AN EFFECTIVE PLANNING, COORDINATION AND MANAGEMENT TRAINING PROGRAM FOR DISTRICT AND REGIONAL LEVEL COUNCILORS AND OFFICIALS.

OUTPUTS: 1. PROJECT COORDINATING COMMITTEE ESTABLISHED; 2. PROJECT SECRETARIAT ESTABLISHED; 3. REGIONAL TRAINING/CONSULTANCY TEAMS TRAINED; 4. CURRICULUM AND MATERIALS DEVELOPED; 5. TRAINING SYSTEM DEVELOPED; 6. SEMINAR/WORKSHOPS; 7. SYSTEMS UPDATE CONTENT AND METHODOLOGY; 8. CONSULTANCY SERVICES.

EVALUATION DOCUMENTATION

COUNTRY/BUREAU: GHANA

PROJECT: 6410000

TITLE: POPULATION PROGRAM SUPPORT

INITIAL FY: 71 FINAL FY: 81

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: POPULATION PROGRAM SUPPORT
 AUTHOR: LORES, GEORGE M

PUBLICATION DATE: 02/03/75
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641000001

ABSTRACT: TO 1/31/75. SECRETARIAT OF NATIONAL FAMILY PLANNING PROGRAM (NFPF) WAS EXPANDED TO INCLUDE 4 REGIONAL SUPERVISORS OUTSIDE OF ACCRA. OVERALL TEAM MANAGEMENT CAPABILITIES WITHIN NFPF AFFECTED PROGRAM IMPLEMENTATION. LACK OF AGREEMENT CONCERNING OPERATIONAL RESPONSIBILITIES PREVENTED CLOSE COOPERATION WITH THE MINISTRY OF HEALTH. WHILE THE NUMBER OF HEALTH CLINICS INCREASED TO 183, CLINICS WERE OFTEN NOT WITHIN EASY ACCESS OF RURAL POPULATION AND HOURS WERE IRREGULAR. 1980 COMMERCIAL OUTLETS FOR CONTRACEPTIVES WERE ESTABLISHED, BUT AGAIN PERFORMANCE WAS VERY WEAK. RETURNED PARTICIPANTS WERE OFTEN PLACED IN INAPPROPRIATE POSITIONS MAKING IT DIFFICULT TO UTILIZE THEIR TRAINING. FORD FOUNDATION PROVIDED FULL-TIME CONSULTANT IN MANAGEMENT/ADMINISTRATION.

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: POPULATION PROGRAM SUPPORT
 AUTHOR: FLORES, GEORGE

PUBLICATION DATE: 08/13/76
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641000001

ABSTRACT: 3/1/75 - 6/1/76. BECAUSE OF DELAY IN PROJECT EXTENSION, SUPPORT WAS LIMITED TO FUNDING OF UNIVERSITY CONFERENCE ON POPULATION STUDIES-PROVIDING SHORT-TERM PARTICIPANT TRAINING. PROJECT WAS EXTENDED 6/76. PLANS WERE DEVELOPED FOR IMPLEMENTATION OF COMMUNITY BASED FAMILY PLANNING PROGRAMS IN CONJUNCTION WITH MATERNAL/CHILD HEALTH SERVICES. 3-YR TRAINING PROGRAM IS TO BE IMPLEMENTED TO IMPROVE NFPF (NATIONAL FAMILY PLANNING PROGRAM) MANAGEMENT AND ORGANIZATION. LACK OF TIMELY AND ACCURATE INFORMATION SYSTEM ON ACCEPTORS, CLINIC AND WAREHOUSE INVENTORIES RESULTED IN 3-YR OVERSUPPLY OF PILLS. PAR RECOMMENDS ASSISTANCE TO STRENGTHEN SUPPLY AND MANAGEMENT SYSTEMS. NFPF LEADERSHIP IS NOW ATTEMPTING TO SECURE SUPPORT FROM REGIONAL AUTHORITIES INCLUDING THE MINISTRY OF HEALTH (MCH). NFPF/MCH RELATIONS APPEARED TO HAVE IMPROVED AND WILL BE TESTED IN MCH IN-SERVICE TRAINING PROGRAM TO BE FUNDED BY USAID/NFPF. UNFPF HAS PROMISED TO BECOME A MAJOR DONOR.

EVALUATION DOCUMENTATION

COUNTRY/BUREAU: GHANA

PROJECT: 6410070

TITLE: AGRICULTURAL MANAGEMENT DEVELOPMENT

INITIAL FY: 75 FINAL FY: 81

DOCUMENT TYPE: PROJECT EVALUATION SUMMARY
 TITLE: AGRICULTURAL MANAGEMENT DEVELOPMENT
 AUTHOR: FULLER, WILLIAM F

PUBLICATION DATE: 06/29/79
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641007000

ABSTRACT: PROJECT TO IMPROVE THE MANAGERIAL AND OPERATIONAL EFFICIENCY AND EFFECTIVENESS OF THE MINISTRY OF AGRICULTURE AND OTHER AGRICULTURAL INSTITUTIONS IN GHANA IS EVALUATED FOR THE PERIOD 1/75 TO 3/79. THE MASTER'S IN AGRICULTURAL ADMINISTRATION (MAA), THE DIPLOMA IN AGRICULTURAL ADMINISTRATION (DAA), AND THE INSTITUTE OF AGRICULTURAL MANAGEMENT (IAM) PROGRAMS ARE FUNCTIONING WITHIN THE SCOPE AND OBJECTIVES OF THE PROJECT AS ORIGINALLY DESIGNED. EACH PROGRAM HAS DEMONSTRATED THAT THE STAFF IS QUALIFIED AND COMPETENT, THE COURSE CONTENT IS RELEVANT, AND THE TEACHING METHODS ARE APPROPRIATE FOR THE CLIENTELE AND DO RESULT IN IMPROVED KNOWLEDGE AND SKILLS. SHORTFALLS HAVE BEEN EXPERIENCED IN STUDENT TRAINING. FACTORS CONTRIBUTING TO THIS SITUATION INCLUDE THE FOLLOWING: 1) CLEARANCE DELAYS FOR AMERICAN PERSONNEL (MAA) DELAYED PROGRAM START-UP ONE YEAR; 2) UNIVERSITY DISTURBANCES DISRUPTED OR CLOSED ALL UNIVERSITY PROGRAMS IN 2 OF 3 YEARS; 3) AGGRESSIVE RECRUITING OF STUDENTS WAS NOT TAKEN FORTHCOMING BY MOA; 4) DELAYED SELECTION OF IAM TRAINERS BY MOA REDUCED THE TRAINING CAPACITY OF THE INSTITUTION BY 50% AND 5) THE SPECIAL EXECUTIVE SEMINARS HAVE NOT BEEN SCHEDULED BY MOA. EVALUATION TEAM RECOMMENDS THE FOLLOWING: 1) INTENSIFY RECRUITING EFFORTS BY THE MOA AND THE UNIVERSITY, AND BROADEN THE RECRUITING BASE BY SEEKING STUDENTS FROM OTHER AGRICULTURE-RELATED MINISTRIES AND STATE CORPORATIONS; 2) IMPROVE THE PROGRAM SUPPORT AND REDUCE THE ADMINISTRATIVE STRUCTURE FOR THE IAM IN A WAY THAT PROVIDES AN IDENTITY AND WORKABLE ADMINISTRATIVE STRUCTURE; 3) INCREASE THE LONG ESSAY RESEARCH SUPPORT FOR THE MAA PROGRAM; 4) DESIGN AND IMPLEMENT AN ONGOING COMMUNICATIONS STRATEGY THAT INCLUDES REGULAR MEETINGS AND DISCUSSIONS BETWEEN PROGRAM ADMINISTRATORS, TOP ECHELON MOA ADMINISTRATORS, AND USAID PROGRAM ADMINISTRATOR

EVALUATION DOCUMENTATION

COUNTRY/BUREAU: GHANA PROJECT: 6410068
 TITLE: ECONOMIC DEVELOPMENT MANAGEMENT INITIAL FYI 71 FINAL FYI 75

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: ECONOMIC DEVELOPMENT MANAGEMENT (FORMERLY
 ECONOMIC AND FINANCIAL MANAGEMENT)
 AUTHOR: GAUGHERTY, RENE

PUBLICATION DATE: 08/16/75
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641006200

ABSTRACT: SUGGESTS POSSIBLE BLOCK GRANT AGREEMENT TO IMPLEMENT ECO DEVEL MANAGEMENT PROJECT WITH GHANA (006). SUGGESTS LOOK AT NEW CONTRACTOR. NOTES TRAINEES EQUAL NUMBER PLANNED, BUT PROJECT TOO NEW TO PERMIT MEANINGFUL JUDGMENT. BEGAN 1972.

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: ECONOMIC DEVELOPMENT MANAGEMENT
 AUTHOR: GAUGHERTY, RENE R

PUBLICATION DATE: 09/16/74
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641006200

ABSTRACT: SUMMARIZES GHANA (006) ECONOMIC DEVELOPMENT MANAGEMENT PROJECT BEGUN IN 1972. NOTES PROJECT SEEKS TO IMPROVE ECO MGMT, DECISION-MAKING AND ANALYTICAL SKILLS, MANPOWER ASSESSMENT. STATES UNIV OF GHANA TARGED WITH RESEARCH REPORT & GOS FAILING TO MAKE MAXIMUM USE OF OTHER REPORTS. PROJECT TOO NEW FOR ASSESSMENT OF TRAINEE PROGRAM.

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: ECONOMIC DEVELOPMENT MANAGEMENT
 AUTHOR: GAUGHERTY, RENE R

PUBLICATION DATE: 08/16/75
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID, GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641006200

ABSTRACT: SUGGESTS RESOURCES BE DIRECTED TOWARDS GREATER EMPHASIS ON GHANA RURAL-REGIONAL DEVELOPMENT IN SELECTION OF PARTICIPANTS, TYPES OF CONSULTANCY SERVICES, LOCAL RESEARCH, SUGGESTS PARTICIPANTS' TRAINING BE EVALUATED AS WELL AS THEIR TRAVEL REIMBURSEMENT. ASKS REVIEW OF RESEARCH. NOTES GOS RELIANCE ON PRIVATE SECTOR COULDED WITH SELECTIVE GOS CONTROLS

EVALUATION DOCUMENTATION

COUNTRY/BUREAU: GHANA PROJECT: 6410087
 TITLE: AGRICULTURE EXT AND PRODUCTION INITIAL FYI 67 FINAL FYI 73

DOCUMENT TYPE: SPECIAL EVALUATION REPORT
 TITLE: FOCUS AND CONCENTRATE PROGRAM EVALUATION
 AUTHOR: GOODWIN, JOSEPH A

PUBLICATION DATE: 08/17/75
 OIC REFERENCE CENTER NUMBER: 30630.7190484
 ORGANIZATION:

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641008700

ABSTRACT: THE PROJECT ONLY COMPLETELY ACCOMPLISHED TWO OF ITS SIX OBJECTIVES, PARTLY ACCOMPLISHED TWO OTHERS, AND COMPLETELY FAILED IN TWO. AS A RESULT, ONE MIGHT THINK THAT THE PROJECT WAS ONLY MARGINALLY SUCCESSFUL. AS A PRODUCTION PROGRAM, IT WAS MARGINALLY SUCCESSFUL. HOWEVER, IF ONE VIEWS THE PROGRAM AS AN EXTENSION TRAINING RATHER THAN PRODUCTION PROJECT, THEN IT MUST BE CONCLUDED THAT AS A PILOT EFFORT THE PROJECT HAS BEEN SUCCESSFUL. THE TWO MISSING ELEMENTS IN THE PROGRAM WERE THE TRAINING COLLEGE AND THE RESEARCH INPUT. ONE REASON FOR THIS FAILURE WAS THAT THE PROJECT WAS SUPPOSED TO BE PRODUCTION-ORIENTED. THE SECOND AREA OF WEAKNESS IN THE PROGRAM WAS THE LACK OF AN EFFECTIVE LINK BETWEEN RESEARCH AND EXTENSION. THE PROJECT MADE A SIGNIFICANT CONTRIBUTION IN DEVELOPING AN EXTENSION PROGRAM THAT HAS HIGH ADAPTABILITY TO GHANA. IT HELPED TO DEVELOP THE ABILITY OF THE FIELD STAFF OF THE EXTENSION SERVICE. HOWEVER, IT WAS DESIGNED SO AS NOT TO ACQUIRE RESOURCES (MEN AND MONEY) THAT, WHILE POSSIBLY AVAILABLE FOR A PILOT PROJECT, COULD BE EXCESSIVE FOR A NATIONAL PROGRAM. THE PROBLEM WITH THE PROJECT IS THAT IT MIXED PRODUCTION WITH EXTENSION TRAINING GOALS. AS A RESULT, THE PROJECT DID NOT COVER ALL ASPECTS OF EXTENSION BUT THOSE PRIMARILY RELATED TO PRODUCTION.

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 COUNTRY/BUREAU: GHANA PROJECT: 641003 SUB-PROJECT: 08
 TITLE: WOMEN IN GHANAIAN DEVELOPMENT INITIAL FY: 76 FINAL FY: 81

PROBLEM: THE PERSISTENT FAILURE TO INVOLVE WOMEN SUFFICIENTLY IN ECONOMIC DEVELOPMENT HAS BEEN A PROBLEM FOR MANY YEARS BUT IT HAS ONLY LATELY BEEN RECOGNIZED AS SUCH BY GOVERNMENTS. GHANA (1980), IN A SECTOR ASSESSMENT PUBLICATION, STATES THAT WOMEN HAD A ROLE IN ECONOMIC PRODUCTION BUT THE BENEFITS THEY DERIVED WERE SLIGHT. FAILURE TO RECOGNIZE THE CONTRIBUTION OF WOMEN OR TO SUPPORT THE WORK THEY ARE DOING HAS AFFECTED THE ABILITY OF THE COUNTRY TO SOLVE SOME OF ITS MOST IMPORTANT DEVELOPMENT PROBLEMS—ESPECIALLY FOOD SUPPLY & POPULATION.

STRATEGY: 3-YEAR PROJECT CONSISTS OF DEVELOPMENT GRANT, INDIVIDUAL GRANTS & COUNSELING SERVICES BY AID TO ASSIST NATIONAL COUNCIL ON WOMEN IN DEVELOPMENT (NCWD) TO ACHIEVE GREATER CAPACITY FOR WOMEN'S INVOLVEMENT IN GHANA'S KEY PROBLEMS. AID FUNDS ALSO PAY FOR COMMODITIES & EQUIPMENT AND SOME GENERAL ADMINISTRATION COSTS. MOST COUNTRY'S PRIVATE VOLUNTEER ORGANIZATIONS WILL DONATE FACILITIES, PROVIDE ADMINISTRATION SERVICES.

SUMMARY:

DEVELOPMENT GRANT TO GHANA (1980) SUPPORTS BOTH PUBLIC AND PRIVATE INITIATIVES AIMED AT ADVANCING THE SOCIO-ECONOMIC STATUS OF WOMEN. PROJECT INCREASES WOMEN'S ABILITY TO CONTRIBUTE TO NATIONAL DEVELOPMENT. THE NATIONAL COUNCIL ON WOMEN IN DEVELOPMENT (NCWD) ACTS AS IMPLEMENTATION AGENT IN THE PUBLIC SECTOR. IN THE PRIVATE SECTOR, WOMEN'S PRIVATE AND VOLUNTEER ORGANIZATIONS (PVOS) ACTIVITIES WILL BE IMPLEMENTED BY GHANA ASSEMBLY OF WOMEN (GAW). A RESEARCH PROGRAM PROVIDES DATA FOR POLICY-MAKERS, DOCUMENTS WOMEN'S CONTRIBUTIONS TO THE ECONOMY, NOTES BARRIERS TO WOMEN'S PARTICIPATION IN WOMEN'S PROJECTS AND IN NATIONAL DEVELOPMENT. PROJECT DEVELOPS A WOMAN POWER PLAN, NOTING INCOME-EARNING OPPORTUNITIES FOR WOMEN; SUPPORTS SEMINARS TO RECOMMEND ACTION PROGRAMS; PROVIDES CONSULTANT SERVICES TO ASSIST NCWD WITH RESEARCH AND ACTIVITIES; AND SUPPORTS PARTICIPANT TRAINING FOR OTHERS TO ASSIST NCWD IN PROGRAMS. IN THE PRIVATE SECTOR, PROJECT DEVELOPS IMPROVED LINKAGES BETWEEN NATIONAL HEADQUARTERS AND RURAL BRANCHES OF WOMEN'S GROUPS, UPDATES LEADERSHIP/MANAGEMENT ABILITIES OF LEADERS OF WOMEN'S GROUPS, AND CREATES CAPACITY TO CONDUCT ON-GOING TRAINING ACTIVITIES. IN ADDITION, PROJECT IMPLEMENTS ACTION PROGRAMS ON KEY PROBLEM AREAS OF WOMEN AND TRAINS PERSONNEL FOR NCWD AND PVO PROGRAMS.

GOAL: TO ADVANCE THE SOCIO-ECONOMIC STATUS OF GHANAIAN WOMEN.

PURPOSE: I. PUBLIC SECTOR—ENHANCEMENT OF THE NATIONAL COUNCIL ON WOMEN & DEVELOPMENT'S (NCWD) CAPACITY TO IDENTIFY, DEFINE & PRESCRIBE SOLUTIONS TO KEY PROBLEMS INHIBITING A MORE PARTICIPATORY ROLE FOR WOMEN IN DEVELOPMENT. II. PRIVATE SECTOR—CREATION OF NATIONWIDE NETWORK OF WOMEN'S PRIVATE/VOLUNTARY ORGANIZATIONS (PVOS) WITH CAPACITY TO HELP RURAL & POOR WOMEN ARTICULATE NEEDS; DESIGN APPROACHES; MOBILIZE RESOURCES & DIRECT PROJECTS TO ADDRESS DEVELOPMENT PROBLEMS OF WOMEN.

OUTPUTS: I. PUBLIC SECTOR—A. ADEQUATE DATA BASE FOR PROGRAM PLANNING & POLICY FORMULATION. B. DEVELOPMENT OF ACTION PROGRAMS. II. PRIVATE SECTOR—A. IMPROVED LINKAGES DEVELOPED BETWEEN NATIONAL HEADQUARTERS AND RURAL BRANCHES OF WOMEN'S GROUPS. B. LEADERSHIP/MANAGEMENT ABILITIES OF LEADERS OF WOMEN'S GROUPS UPGRADED AND CAPACITY TO CONDUCT ON-GOING TRAINING ACTIVITIES CREATED. C. ACTION PROGRAM ON KEY PROBL AREAS OF WOMEN IMPLEMENTED. III. TRAINED PERSONNEL AVAILABLE FOR NCWD & PVO PROGRAMS.

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 COUNTRY/BUREAU: GHANA PROJECT: 641004 SUB-PROJECT: 08
 TITLE: FACULTY OF AGR UNIV OF GHANA INITIAL FY: 86 FINAL FY: 76

PROBLEM: FACULTY OF AGRICULTURE OF THE UNIVERSITY OF GHANA LACKED THE FACILITIES REQUIRED TO PRODUCE TOP AGRICULTURAL LEADERSHIP THOROUGHLY GROUNDED IN TROPICAL AGRICULTURE AND PARTICULARLY IN GHANAIAN AGRICULTURE.

STRATEGY: RECRUIT UPEX PERSONNEL OF FULL PROFESSIONAL RANK TO PROVIDE THE LEADERSHIP IN DEVELOPING PROGRAMS FOR FACULTY OF AGRICULTURE.

SUMMARY: PROJECT IS DIRECTED TOWARD IMPROVING HIGH LEVEL EDUCATION IN AGRICULTURE IN THE UNIVERSITY OF GHANA'S FACULTY OF AGRICULTURE. THE ULTIMATE AIM IS TO DEVELOP IN GHANA THE FACILITIES REQUIRED TO PRODUCE A TOP AGRICULTURAL LEADERSHIP THOROUGHLY GROUNDED IN TROPICAL AGRICULTURE, PARTICULARLY GHANAIAN AGRICULTURE. FOUR U.S. PROFESSORS ARE PROVIDED FOR YEARS EACH IN ANIMAL HUSBANDRY, AGRICULTURAL ENGINEERING, AGRICULTURE EXTENSION AND AGRICULTURAL ECONOMICS. EACH WILL DEVELOP A PROGRAM OF CREATIVE RESEARCH DESIGNED TO CONTRIBUTE TO GHANA'S AGRICULTURAL DEVELOPMENT. IMPROVED CURRICULA WILL ALSO BE DEVELOPED, AND TEACHING WILL BE CENTERED AROUND FIELD RESEARCH AND EXPERIMENTATION.

GOAL: GOVT OF GHANA ADOPTS POLICY REFORMS NECESSARY FOR AGRICULTURAL DEVELOPMENT. I

PURPOSE: COMPLETELY WELL TRAINED AGRICULTURISTS GRADUATED WITH KNOWLEDGE OF GHANAIAN AGRICULTURE. I

OUTPUTS: EXPANDED PROGRAM OF ADAPTIVE RESEARCH; IMPROVED CURRICULA; IMPROVED PROGRAM OF INFORMATION EXCHANGE BETWEEN FACULTY OF AGRICULTURE AND THE AGRICULTURAL COMMUNITY; HIGH QUALITY OF DEPARTMENTS OF AGRICULTURAL ENGINEERING, AGRICULTURE EXTENSION AND ANIMAL SCIENCE. I

EVALUATION DOCUMENTATION

COUNTRY/BUREAU: GHANA

PROJECT: 641888

TITLE: NGMT RURAL HEALTH SERVICES

INITIAL FY: 76 FINAL FY: 81

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
TITLE: GHANA-MANAGEMENT OF RURAL HEALTH SERVICES
AUTHOR: COHEN, ERVIN D

PUBLICATION DATE: 10/29/76
DIC REFERENCE CENTER NUMBER:
ORGANIZATION: AID/

PROJECTS (AND SUB-PROJECTS) EVALUATED: 64188888

ABSTRACT: POTENTIALLY QUALIFIED STAFF FOR TRAINING NOT YET SELECTED BY NGM IN NUMBERS REQUIRED TO ASSURE DEVELOPMENT. PLANNING UNIT DOMINATED BY EXPATRIATE ADVISORS & HAS SLOW START ON INSTITUTIONAL DEVELOPMENT. NGM/FP, NUTRITION AND OTHER PREVENTIVE MEASURES NOT FULLY ACCEPTED AND INTEGRATED IN PLANS ON POLICY. LOGISTIC SERVICES LACK SPARE PARTS AND EQUIPMENT.

DOCUMENT TYPE: AUDIT REPORT
TITLE: REPORT ON EXAMINATION OF THE MANAGEMENT OF RURAL HEALTH SERVICES PROJECT IN GHANA
AUTHOR:

PUBLICATION DATE: 11/17/76
DIC REFERENCE CENTER NUMBER: 6461.39467255
ORGANIZATION: AID, AUDITOR GENERAL AFRICA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 64188888

ABSTRACT: EVALUATES PERFORMANCE FROM JAN 1, 1975 TO JUL 31, 1976 OF A PROJECT TO STRENGTHEN PLANNING, MANAGEMENT AND PROGRAM IMPLEMENTATION CAPABILITIES OF GHANIAN MINISTRY OF HEALTH (NGM). CONTRACTOR FAILURES RESULTED IN PROJECT EXTENSION TO NOV 1, 1977. PROJECT WAS DESIGNED TO ASSIST NGM IN ESTABLISHING A PLANNING UNIT, TO PROVIDE SPECIALIZED FUNCTIONAL PLANNING AND MANAGEMENT TRAINING, TO HELP PRODUCE A 5 YEAR HEALTH SECTOR PLAN AND TO PROVIDE TECHNICAL ASSISTANCE FOR A VEHICLE PREVENTIVE MAINTENANCE AND REPAIR PROGRAM. EVALUATION INVOLVED REVIEW OF PROJECT AND FINANCIAL RECORDS, DISCUSSIONS WITH AID CONTRACTOR (KATSEB FOUNDATION INTERNATIONAL) AND GOVT OF GHANA (GOG) PERSONNEL, AND VISITS TO NGM PLANNING UNIT OFFICE. THE PLANNING UNIT IS IN OPERATION, ALTHOUGH LESS THAN HALF THE TRAINEES FOR STAFFING HAVE BEGUN TRAINING. DUE TO CONTRACTING AND TRAINING DELAYS, PROJECT IMPLEMENTATION IS 3 YEARS BEHIND SCHEDULE, RESULTING IN ANOTHER REQUEST FOR EXTENSION. LACK OF A GHANIAN COUNTERPART MANAGER AND UNAVAILABILITY OF SPARE PARTS REDUCE THE EFFECTIVENESS OF TECHNICAL ASSISTANCE FOR THE VEHICLE MAINTENANCE AND REPAIR PROGRAM. OTHER DEFICIENCIES INCLUDE INADEQUATE INFORMATION FOR DETERMINING GOG'S FINANCIAL CONTRIBUTION TO THE PROJECT AND INAPPROPRIATE SUPPORT SERVICES TO CONTRACTOR PERSONNEL. REEVALUATION OF THE NEED FOR A TRANSPORTATION ADVISOR IS RECOMMENDED, IN VIEW OF GOG'S UNWILLINGNESS TO PROVIDE A COUNTERPART OR TO SOLVE THE SPARE PARTS PROBLEM. EVALUATOR ALSO RECOMMENDS OBTAINING AND ACTING UPON A LEGAL OPINION CONCERNING AID'S LIABILITY FOR DAMAGES IN CONNECTION WITH GOG PURCHASE OF OFFICE SPACE IN AN AID-LEASED HOUSE, AN UNDOCUMENTED TRANSACTION.

EVALUATION DOCUMENTATION

COUNTRY/BUREAU: GHANA

PROJECT: 641999

DOCUMENT TYPE: SPECIAL EVALUATION REPORT
TITLE: FOOD FOR PEACE: AN EVALUATION OF PL-480 TITLE II
AUTHOR:

PUBLICATION DATE: 07/01/72
DIC REFERENCE CENTER NUMBER: 338.912314V.1ANOV.2
ORGANIZATION: CHECCO AND COMPANY

PROJECTS (AND SUB-PROJECTS) EVALUATED: 383999999 43999999 49299999 57999999 51499999 51799999 60499999 64199999

ABSTRACT: VOLUME I CONTAINS A GLOBAL ASSESSMENT OF THE PROGRAM. VOLUME II CONTAINS EIGHT COUNTRY REPORTS ON THE PHILIPPINES, MALAYSIA, COLOMBIA, THE DOMINICAN REPUBLIC, GUATEMALA, GHANA, INDONESIA, AND CEYLON. THE OVERALL CONCLUSION OF THE EVALUATION IS THAT THE PL 480 TITLE II PROGRAM, AS IT NOW STANDS, IS GENERALLY SOUNDLY CONCEIVED, WELL-ADMINISTERED, AND HAVING A SIGNIFICANT IMPACT ON THE ECONOMIC AND HUMAN DEVELOPMENT OF RECIPIENT COUNTRIES. RECOMMENDED CHANGES ARISE PRIMARILY FROM OBSERVATIONS OF MISSED OPPORTUNITIES OR LESS THAN FULL UTILIZATION OF THE POTENTIAL INHERENT IN THE PROGRAM. POLICY RECOMMENDATIONS ARE: (1) GIVE INCREASED EMPHASIS TO TITLE II AS PART OF AID'S PACKAGE OF DEVELOPMENT ASSISTANCE; (2) EMPHASIZE NUTRITION IN TITLE II PROGRAMMING; (3) REVISE THE ORDER OF PRIORITIES OF TITLE II TO EMPHASIZE "MATERNAL/CHILD HEALTH" AND DE-EEMPHASIZE SCHOOL FEEDING; (4) PROGRESSIVELY SHIFT PLANNING RESPONSIBILITY TO HOST GOVERNMENTS; (5) HAVE MULTI-YEAR COUNTRY PLANS THE BASIS FOR FOOD ALLOCATIONS AMONG RECIPIENT COUNTRIES; (6) ALLOW MORE PROGRAMMING FLEXIBILITY AT THE COUNTRY LEVEL; AND (7) BRING VOLUNTARY AGENCIES MORE CLOSELY INTO THE COUNTRY PLANNING PROCESS. THE EVALUATORS ALSO MADE OPERATIONAL RECOMMENDATIONS ABOUT VARIOUS ASPECTS OF THE PROGRAM.

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EVALUATION DOCUMENTATION

COUNTRY/ORGANIZATION: GHANA

PROJECT: 0410000

TITLE: DANPA RURAL HEALTH FAMILY PLAN

INITIAL FYI 76 FINAL FYI 81

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: DANPA RURAL HEALTH-- FAMILY PLANNING
 AUTHOR: FELDMAN, MICHAEL

PUBLICATION DATE: 11/19/71
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 041005504 041005503 041005502 041005501

ABSTRACT: 8/76-11/71. CONTRACTOR REPORTS LACK PRECISION, EDITORIAL REVIEW. DEPARTING TRAINERS NEED MORE ORIENTATION ON PROJECT. PARTICIPANTS SELECTED WITHOUT INVOLVEMENT OF PROJECT ADMINISTRATORS. SURVEYS BEHIND SCHEDULE. COST ACCOUNTING DATA PRESENTS PROBLEMS FOR RECORD SYSTEM.

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: DANPA RURAL HEALTH--FAMILY PLANNING
 AUTHOR: MYNES, RICHARD J

PUBLICATION DATE: 03/30/74
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 041005504 041005503 041005501

ABSTRACT: 10/71-3/73. SHORTAGE OF VEHICLES AND POOR MAINTENANCE HAVE HINDERED PROJECT. PROJECT PROGRESSING AS PLANNED, BUT ROLE OF USAID, GHANA'S MINISTRY OF HEALTH & UNIV OF GHANA'S MEDICAL SCHOOL & UCLA MUST BE CAREFULLY DELINEATED FOR OPTIMUM COST EFFECTIVENESS.

DOCUMENT TYPE: SPECIAL EVALUATION REPORT
 TITLE: EVALUATION OF THE DANPA COMPREHENSIVE RURAL HEALTH AND FAMILY PLANNING PROJECT IN GHANA (3/15/75-3/27/75)

PUBLICATION DATE: 03/27/75
 OIC REFERENCE CENTER NUMBER: 04614.19346C316

AUTHOR: BELFANO, HENRY M (MO)
 ALLEN, DAVID T (MO)
 HELLER, PETER S (MO)
 HUBER, DOUGLAS M (MO)

ORGANIZATION: AMERICAN PUBLIC HEALTH ASSOCIATION

PROJECTS (AND SUB-PROJECTS) EVALUATED: 041005501 041005504 041005503 041005502

ABSTRACT: REEVALUATES PROJECT PERFORMANCE FROM 1970 TO 1974 IN GHANA. THE DANPA COMPREHENSIVE RURAL HEALTH & FAMILY PLANNING PROJECT WAS ESTABLISHED TO IMPROVE RURAL HEALTH SERVICE & INCREASE FAMILY PLANNING ACTIVITIES. EVALUATION METHODOLOGY WAS BASED ON ON-SITE OBSERVATIONS, CONSULTATIONS WITH STAFF, INTERVIEWS, & MISSION RECORDS. PROJ HAS SERVED GHANA WELL. DEDICATION & SKILL OF PERSONNEL ARE GOOD. ALL PERSONS WHO HAVE COMPLETED TRAINING OVERSEAS HAVE RETURNED TO GHANA & ARE MAKING CONSIDERABLE CONTRIBUTIONS TO THEIR COUNTRY. HAVING ACQUIRED SKILLS PREVIOUSLY UNAVAILABLE IN GHANA. STUDIES IN RURAL AREAS HAVE CLARIFIED THE NATURE OF HEALTH PROBLEMS FORMERLY DISTORTED BY CLINICS & HOSPITALS. ALTHOUGH THERE IS GOOD COMMUNICATION BETWEEN THE GHANA MEDICAL SCHOOL & MINISTRY OF HEALTH, CHANNELS OF COMMUNICATION COULD IMPROVE AT HIGHER LEVELS & WITH OTHER ORGANIZATIONS. EVALUATION WAS SEVERELY HINDERED BY INSUFFICIENT TIME FOR EXAMINATION & ANALYSIS OF PRESENT DATA. DIFFICULTY IN WATCHING EVENTS RECORDED FROM DIFFERENT SOURCES; TOO SMALL A SAMPLING SIZE TO ADEQUATELY INDICATE STATISTICALLY SIGNIFICANT CHANGES IN FERTILITY & MORTALITY; HIGH RATE OF IMMIGRATION WITHIN GHANA WHICH ALTERS TRUE PICTURE OF POPULATION GROWTH IN THE AREAS STUDIED; IDENTIFYING THE BEST DELIVERY SYSTEM; INNOVATIVE METHODS FOR FAMILY PLANNING; LACK OF FUNDS TO SUPPLY THE BASIC RAW MATERIALS NECESSARY FOR IMPROVING HEALTH RECOMMENDATIONS ARE TO CONTINUE PROJ THROUGH 3/1979 IN A MODIFIED FORM REDUCING "ACADEMIC" RESEARCH & INCREASING OPERATIONAL RESEARCH OF A MORE IMMEDIATE, PRACTICAL NATURE; CONTINUE ASSESSMENT OF CLINICAL PREVENTIVE, HEALTH EDUCATION & FAMILY PLANNING SERVICES AS TO THEIR EFFECTS & COSTS; DISSEMINATE FINDINGS OF OPERATIONAL & EPIDEMIOLOGICAL INVESTIGATIONS MORE RAPIDLY; STUDY WAYS TO USE HEALTH & FAMILY PLANNING SERVICES IN OTHER PARTS OF GHANA; STUDY EFFECTIVENESS OF DISEASE PREVENTION MATERIALS & PROCEDURES; CAPINO LOCAL & US TRAINING; PRODUCE A NEW SCHEDULE OF PROJECTED ACTIVITIES & EXPECTED PRODUCTS; USE MORE LOCAL STAFF; & EXPLORE REDUCTN IN US-BASED, UNIVERSITY OF SOUTHERN CALIFORNIA PERSONNEL.

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: DANPA RURAL HEALTH--FAMILY PLANNING
 AUTHOR: FLORES, GEORGE

PUBLICATION DATE: 12/13/76
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 041005504 041005503 041005502 041005501

ABSTRACT: 6/75-6/76 USAID MUST REVIEW FUTURE UCLA BUDGET AND DATA ANALYSIS PROPOSALS TO ASSURE ORIENTATION TOWARD PRACTICAL APPLICATION IN DEVELOPMENT ASSISTANCE. ANALYSIS WILL REMAIN BEAR POINT IN PROJECT BECAUSE EARLY LACK OF COUNTERPARTS WITH GHANA MEDICAL SCHOOL FROM ASSUMING ITS FULL ROLE. IMPROVEMENTS COULD BE MADE IN GHANESEAN TECHNICAL SKILLS, ANALYSIS CAPABILITY, AND PLANNING AND MANAGEMENT CAPACITY. GHANESEANS ARE ASSUMING MORE CONTROL AS RETURNED PARTICIPANTS FILL VACANT POSITIONS, BUT INVOLVEMENT IN WRITING REPORTS AND PUBLICATIONS HAS NOT IMPROVED NOTICEABLY. MOST REPORTS ARE DONE BY UCLA STAFF.

EVALUATION DOCUMENTATION

COUNTRY/ORGANIZATION: GHANA PROJECT: 6418863
 TITLE: OPPORTUNITIES INDUSTRIALIZATION INITIAL FVI TO FINAL FVI 75

DOCUMENT TYPE: SPECIAL EVALUATION REPORT
 TITLE: AN ASSESSMENT OF THE OPPORTUNITIES
 INDUSTRIALIZATION CENTERS INTERNATIONAL PROGRAM
 AUTH:ORI

PUBLICATION DATE: 07/01/71
 OIC REFERENCE CENTER NUMBER: APR331.006734
 ORGANIZATION: COMMUNITY SCIENCES, INC.

PROJECTS (AND SUB-PROJECTS) EVALUATED: 62988200 641886300

ABSTRACT: THE EVALUATION DISCUSSES THE CENTRAL OFFICE OF THE OPPORTUNITIES INDUSTRIALIZATION CENTER (OIC) IN THE UNITED STATES, AND THE OIC PROGRAMS IN NIGERIA AND GHANA. THE PROGRAM'S ORGANIZATION AND STRUCTURE, RELATIONS WITH COMMUNITY, INDUSTRY, AND GOVERNMENT; QUALITY OF INSTRUCTION; PROJECTIONS AND OTHER MATTERS ARE DISCUSSED. THE LAGOS OIC BOARD HAS MADE MUCH PROGRESS IN SECURING THE SUPPORT OF COMMUNITY, INDUSTRY AND GOVERNMENT. THE BOARD NEEDS ADDITIONAL HELP TO RETAIN ITS ACTIVITIES. COOPERATION WITH INDUSTRY AND GOVERNMENT, IN ORDER TO ESTABLISH A BROADER BASE FOR CONTINUING SUPPORT FROM THESE SOURCES. GHANA GOVERNMENT ECONOMIC POLICIES HAVE CREATED A FIRED LABOR MARKET IN THE ACCRA-TEMA AREA WITH LITTLE JOB TURNOVER AND, THUS LIMITED TRAINING. THESE POLICIES LIMIT THE NUMBER OF SKILLED TRAINEES WHO CAN BE PLACED IN ENTRY LEVEL JOBS IN THE ACCRA-TEMA AREA. THERE IS, HOWEVER, GOVERNMENT AND BUSINESS INTEREST AND SUPPORT IN THE DEVELOPMENT OF SMALL, SERVICE AND MANUFACTURING INDUSTRY OUTSIDE THE MAJOR METROPOLITAN AREAS. TRAINING DIRECTED TOWARD SELF-EMPLOYMENT AND SMALL BUSINESS DEVELOPMENT OUTSIDE THE ACCRA-TEMA AREA WILL INCREASE THE NUMBER OF JOBS AVAILABLE FOR OIC TRAINEES. THE EVALUATION HAS 19 RECOMMENDATIONS ABOUT THE OIC CENTRAL OFFICE AND THE PROGRAMS IN GHANA AND NIGERIA.

DOCUMENT TYPE: AUDIT REPORT
 TITLE: AUDIT REPORT NO. 72-181, ADVISORY REPORT TO THE
 CONTRACTING OFFICER ON EXAMINATION OF ACCOUNTING
 RECORDS OF OPPORTUNITIES INDUSTRIALIZATION CENTER
 INTERNATIONAL, INC., CONTRACT NO. AID/A79-493
 AUTH:ORI

PUBLICATION DATE: 12/22/71
 OIC REFERENCE CENTER NUMBER:

ORGANIZATION: AID/W OFFICE OF AUDIT

PROJECTS (AND SUB-PROJECTS) EVALUATED: 62988200 641886300 698015300

ABSTRACT:

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: OPPORTUNITIES INDUSTRIALIZATION CENTER (OIC)
 AUTH:ORI JACKSON, TENNESSEE

PUBLICATION DATE: 07/29/73
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641886300

ABSTRACT: MAKES 7 RECOMMENDATIONS. CONTRACTOR AND COUNTERPART ORGANIZATION EVALUATED. PARTICIPANT TRNG COMPONENT ONLY MARGINALLY SATISFACTORY. 3 OUTPUTS ARE DISCUSSED; TECH ASSIST TEAM BEING PHASED OUT AHEAD OF SCHEDULE; BEHIND SCHEDULE ON GRASS/VR. 2 END OF PROJECT CONDITIONS MENTIONED.

DOCUMENT TYPE: PROJECT APPRAISAL REPORT
 TITLE: OPPORTUNITIES INDUSTRIALIZATION CENTER
 AUTH:ORI MYNES, R

PUBLICATION DATE: 10/04/75
 OIC REFERENCE CENTER NUMBER:
 ORGANIZATION: USAID/GHANA

PROJECTS (AND SUB-PROJECTS) EVALUATED: 641886300

ABSTRACT: MAKES 6 RECOMMENDATIONS. CONTRACTOR, COUNTERPART RATED VERY SATISFACTORY. PROGRESS TOWARD OUTPUTS IS VERY CLOSE TO TARGET. 3 OUTPUTS ARE DISCUSSED. PROGRESS TOWARD 3 END OF PROJECT CONDITIONS IS EVALUATED.

DOCUMENT TYPE: AUDIT REPORT
 TITLE: AUDIT REPORT: OPPORTUNITIES INDUSTRIALIZATION
 CENTERS INTERNATIONAL, INC.; AUDIT REPORT NO.
 79-319
 AUTH:ORI

PUBLICATION DATE: 10/20/75
 OIC REFERENCE CENTER NUMBER:

ORGANIZATION: AID/W OFFICE OF AUDIT

PROJECTS (AND SUB-PROJECTS) EVALUATED: 663017500 618018900 62988200 641886300 698015300

ABSTRACT:

DOCUMENT TYPE: AUDIT REPORT
 TITLE: OPPORTUNITIES INDUSTRIALIZATION CENTERS
 INTERNATIONAL, INC. CONTRACT NO. AID/A79-493,
 AUDIT REPORT NO. 788-300
 AUTH:ORI

PUBLICATION DATE: 02/27/76
 OIC REFERENCE CENTER NUMBER:

ORGANIZATION: AID/W OFFICE OF AUDIT

PROJECTS (AND SUB-PROJECTS) EVALUATED: 62988200 641886300

ABSTRACT:

DOCUMENT TYPE: AUDIT REPORT
TITLE: OPPORTUNITIES INDUSTRIALIZATION CENTERS
INTERNATIONAL, INC.: AUDIT REPORT NO. 766-299
AUTHOR:

PUBLICATION DATE: 02/27/76
DTC REFERENCE CENTER NUMBER:
ORGANIZATION: AID/4 OFFICE OF AUDIT

PROJECTS (AND SUB-PROJECTS) EVALUATED: 663017500 612015900 641006300 626000200 690019300

ABSTRACT:

DOCUMENT TYPE: AUDIT REPORT
TITLE: OPPORTUNITIES INDUSTRIALIZATION CENTERS
INTERNATIONAL, INC. CONSOLIDATION OF COST
INFORMATION
AUTHOR:

PUBLICATION DATE: 02/27/76
DTC REFERENCE CENTER NUMBER:

ORGANIZATION: AID/4 OFFICE OF AUDIT

PROJECTS (AND SUB-PROJECTS) EVALUATED: 663017500 612015900 641006300 626000200 690019300

ABSTRACT:

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- E: sedimentology.
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