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AGENCY FOR
INTERNATIONAL
DEVELOPMENT

DEVELOPMENT ASSISTANCE PROGRAM

1976 – 1980

CENTRAL - WEST AFRICAN REGION

Volume I: Overview and Program Conclusions

(SECTIONS I and II)

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NOTICE

Sections I and II (Volume One) of this Development Assistance Program have been reviewed and accepted by A.I.D. as the basis for further planning, project identification, and design. Volume One therefore represents A.I.D.'s basic statement of approach toward U.S. economic assistance in the francophone West and Central Africa area in the next three to five years (1976 - 1980). These program recommendations are subject to further Executive Branch and Congressional review and approval, however, and to the appropriation of funds for specific undertakings. Thus, the program recommendations do not necessarily signify the support of the U.S. Government for specific undertakings.

Section III (the country annexes) form the basis for the program recommendations contained in Volume One, and are published primarily as internal A.I.D. background documents for working purposes. These annexes in four volumes are the direct product of an extensive field effort conducted by interdisciplinary teams composed of A.I.D. and non-official personnel under A.I.D. contract. These annexes have not been edited to correct all errors, omissions, and mis-statements which may exist. Nor have all recommendations contained in these volumes, notably those regarding bilateral programs to Ivory Coast, Togo, and Dahomey, been accepted as U.S. Government policy.

Shaded countries denote CWR area covered in this report.

THE REPRESENTATION IS NOT NECESSARILY AUTHORITATIVE

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DEVELOPMENT ASSISTANCE PAPER
FOR
THE CENTRAL-WEST AFRICAN REGION

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A PARTIAL LIST OF ORGANIZATIONS

WITH INTEREST FOR THE CENTRAL-WEST AFRICAN REGION

ACP - African Carribean Pacific States

AFDB - African Development Bank (Abidjan)

AISH - Association Internationale des Sciences Hydrologiques

ASECNA - Agence pour la Securite de la Navigation Aerienne

BCEAO - Banque Centrale des Etats de l'Afrique de l'Ouest (Dakar/Abidjan)

BEAC - Banque des Etats de l'Afrique Centrale (Dakar/Abidjan)

BIAO - Banque Internationale de l'Afrique Occidentale (Dakar/Abidjan)

BRGM - Bureau de Recherches Geologiques et Minières (France)

CAFRAD - African Council for Administration and Research in Development (Tunis)

CBLT - French for LCBC

CCCE - Caisse Centrale de Cooperation Economique (Paris)

CDC - Center for Disease Control (U.S. Dept. of Health) (Atlanta)

CEA - French for ECA

CEAO - West African Economic Community (Communaute Economique de l'Afrique de l'Ouest) (Ouagadougou)

CEEMAT - Centre d'Etudes et d'Experimentation de Mechanisme Agricole Tropicale (Dakar)

CERFER - Regional Road Maintenance and Training Center (Lome)

CGIAR - Consultative Group on International Agricultural Research

CIDA - Canadian International Development Agency (Canadian Government) (Ottawa)

CIEH - Comité Inter-African d'Etudes Hydrauliques (Ouagadougou)

CILSS - Permanent Inter-State Committee for Draught Control in the Sahel (Ouagadougou)

CIMMYT - International Center for Corn and Wheat Improvement (Mexico)

CRS - Catholic Relief Services (New York)

CTFT - Centre Technique Forestier Tropical

CUSS - University Center for Health Sciences (Yaounde)

CVL - Central Veterinary Laboratory (Bamako)

CWS - Church World Service (New York)

DAC - Development Assistance Committee (OECD) (Paris)

ECA - Economic Commission for Africa (Addis Ababa)

ECOWAS - Economic Community of West African States

EEC - European Economic Community (Brussels)

EF - Entente Fund (Abidjan)

ELC - Entente Livestock Community (Ouagadougou)

FAC - Fonds d'Aide et de Cooperation (French Government) (Paris)

FAO - Food and Agricultural Organization (UN) (Rome)

FED - Fonds Europeen de Developpement (EEC)

FPIA - Family Planning International Assistance

GERDAT - Groupement d'Etudes et de Recherches pour le Developpement de l'Agronomie Tropicale

IBRD - World Bank (International Bank for Reconstruction and Development) (Washington, D. C.)

ICRISAT - International Crop Research Institute for the Semi-Arid Tropics (Hyderabad, India)

IDA - International Development Association (of IBRD)

IDEP - Institut de Développement Economique et de Planification (Dakar)

IDRC - International Development Research Centre (Ottawa)

IEMVT - Institut d'Elevage et de Medecin Veterinaire des pays Tropicaux

IFAC - Institut Francais de Recherches Fruitieres Outre-Mer.

IFAN - Institut Fondamental d'Afrique Noire (Dakar)

IFCC - Institut Francais de Cafe, du Cacao, et d'Autres Plantes Stimulantes

IITA - International Institute of Tropical Agriculture (Ibadan)

ILCA - International Livestock Center for Africa (Addis Ababa)

ILRAD - International Laboratory for Research on Animal Diseases (Nairobi)

IMF - International Monetary Fund (Washington, D. C.)

INSEE - Institut National des Statistiques et des Etudes Economiques (France)

IPPF - International Planned Parenthood Federation

IRAT - Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres (Paris)

IRCA - Institut de Recherche sur le Caoutchouc en Afrique

IRCT - Institut de Recherche du Coton et des Textiles Exotiques

IRFED - Institut de Recherche en Matiere de Formation et d'Education pour le Developpement

IRHO - Institut de Recherches pour les Huiles et les Oleagineuses

IRRI - International Rice Research Institute (Philippines)

JP26 - Joint Project 26 (Amadu Bello University)

LCBC - Lake Chad Basin Commission (N'Djamena)

LGA - Liptako-Gourma Authority (Ouagadougou)

NAS - National Academy of Sciences (Washington, D. C.)

NASA - National Advanced School of Agriculture (University of Cameroon)

NOAA - National Oceanic and Atmospheric Administration (U.S. Dept. of Commerce) (Washington, D. C.)

NRBD or
NRC - Niger River Commission (Niamey)

OAU - Organization for African Unity (Addis Ababa)

OCAM - Organisation Commune Africaine et Malagache (Yaounde)

OCCGE - Organization for Cooperation and Coordination in the Control of Endemic Diseases in West Africa (Bobo-Dioulasso, Upper Volta)

OCDE - French for OECD

OCEAC - Organization for Control of Endemic Diseases in Central Africa (Yaounde)

OCLALAV - Organization for Control of Locusts and Birds (Dakar)

ODA - Overseas Development Assistance

OECD - Organization for Economic Cooperation and Development (Paris)

OICMA - International Organization for Control of African Migratory Locust (Bamako)

OMVS - Organisation pour la Mise en Valeur du Fleuve Senegal (Dakar)

ONAREST - Office National de la Recherche Scientifique et Technique (Cameroon)

ORANA - Agency for Food and Nutrition Research in Africa (Dakar)

ORSTOM - Office de Recherches Scientifiques et Techniques Outre-Mer (Paris)

ORT - Organization for Rehabilitation through Training (Geneva)

OSRO - Office for Sahelian Relief Operations (FAO) (Rome)

PAID - Pan-African Institute for Development (Geneva) (Cameroon)

REDSO - Regional Economic Development Services Office (USAID) (Abidjan)

SAED - Société Africaine d'Etudes et de Developpement (Ouagadougou)

SCS - Soil Conservation Service (USDA) (Washington, D. C.)

SEDES - Societe d'Etudes pour le Developpement Economique et Social (Paris)

SIDA - Swedish International Development Agency (Government of Sweden) (Stockholm)

STRC - Scientific, Technical, and Research Commission (of OAU)

UDEAC - Union Douanière et Economique de l'Afrique Centrale (Paris)

UDEAO - Union Douanière et Economique de l'Afrique de l'Ouest (Paris)

UMOA - West African Monetary Union

UNDP - United Nations Development Program (New York)

UNEP - United Nations Environmental Program (Nairobi)

UNFPA - United Nations Family Planning Association

UNICEF - United Nations Childrens Emergency Fund (New York)

UNIDO - United Nations Industrial Development Organization (Vienna)

UNSO - United Nations Special Sahelian Office (New York, Ouagadougou)

USAID - United States Agency for International Development (Washington,D.C.)

VVA - Volta Valley Authority (Ouagadougou) (AVV in French)

WARDA - West African Rice Development Association (Monrovia)

WFP - World Food Program (of FAO) (Rome)

WHO - World Health Organization (UN) (Geneva, Brazzaville)

WMO - World Meteorological Organization (UN) (Geneva)

DEVELOPMENT ASSISTANCE PAPER
FOR
THE CENTRAL-WEST AFRICAN REGION

Section One: Overview

This Development Assistance Paper (DAP)-Substitute for the francophone West and Central African region (AFR/CWR)*/ is designed primarily to provide recommendations for the transfer of development resources at both regional and country levels over the five year period, 1976-1980.

This paper is organized in three parts. Section One represents an overview of regional characteristics, key sectoral bottlenecks, and the broad principles which we believe should govern the U.S. assistance strategy in this region. Section Two sets forth various conclusions about the prospects for each of the major regional and country programs with which AID has been or may become, involved. Section Two also contains recommendations for future U.S. development activities in this area, both regional and national. Finally, Section Three presents the findings, country by country, upon which the country project recommendations are based.

I. Regional Characteristics

A. Diversity of Interdependence

West and Central Africa, in which the CWR region resides, encompasses a vast area stretching from Senegal east to Chad and thence south to the Congo River. U.S. assistance to this area is provided through regional and bilateral programs including 20 countries inhabited by 100 million people in an area larger than the United States. All of the countries are motivated by a strong sense of nationalism, which is sometimes reflected in the duplication of expensive facilities. All of the nations are recently independent, frequently with governmental structures still in the process of adjusting to the requirements of effectively organizing for economic development. At the same time, the participation of national governments in international and regional governmental activities reflects their common interest and their recognition of the need for regional solutions to common problems. An interdependence of geography, peoples, and economy has bound the area in common relationships susceptible to regional analysis, planning and development.

Within this great area, the assistance programs administered by the Central-West Africa Regional Office (AFR/CWR), which form the subject of this paper, affect 14 countries with a combined population of nearly

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*/ The AFR/CWR office assumes responsibility for U.S. assistance to the following countries (in order, from west to east): Senegal, the Gambia, Mauritania, Guinea, Mali, Ivory Coast, Togo, Niger, Dahomey, Cameroon, Chad, Gabon, and the Central African Republic. The Gambia, for which no long-term U.S. program is proposed, has been omitted from this review.

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50 million. Two general observations apply to the CWR region as a whole. The first, to which we will return later in greater detail, is that this region is one of the poorest on earth. Some 90 percent of the population lives in rural areas, where subsistence agriculture predominates. Few roads are paved, many areas are difficult to reach and some are inaccessible except on foot. The per capita gross national product is some $129 when averaged for the region as a whole. In addition, the meager capital wealth is concentrated in the hands of a few. Illiteracy rates average 85-90 percent. While the United States is dissatisfied with an infant mortality rate of less than 20 per thousand, countries of this region have rates which vary between 100-200 per thousand. In some countries only one-half of the children born alive can be expected to live beyond the age of five years. Nonetheless, the current growth rate of population is estimated to be 2.2-2.5 percent per annum.

The second striking characteristic of the area is its remarkable diversity. This is reflected in ecological zones which vary from dense tropical rain forest in the south through various gradations of savannah, to desert in the north. It is reflected in scores of tribal heritages, languages and dialects overlaid by different colonial legacies. It is also apparant in the contrast between the oil, mineral and timber wealth of some countries (e.g., Gabon) and the poverty of the sub-Saharan (Sahelian) desert areas. Although there are a few major concentrations of population, in cities of 50,000 to more than one million, the vast majority of people live in rural areas. Such diversity (and dispersity) has presented a difficult challenge to the newly independent governments. They have been forced to promote and accentuate national identity, in part to prevent their nations from disintegrating into separate regions; but at the same time, the governments recognize the advantages that regionalization may offer for certain aspects of economic development.

Historically, there has been an underlying common experience which is the basis for future cooperation. Prior to the European colonization period, the pattern of life in this region was complex but well integrated into the larger network spanning the African continent. The nomadic pastoral populations and the southern more sedentary groups were linked through complex trade and commercial relations extending from the Mediterranean region in the north, to the peoples of the forest zone in the south.

In addition, beginning very early and pursued until the Sixteenth to Eighteenth centuries, various empires uniting large aggregates of people rose and declined, e.g., the vast empires of ancient Mali, the Toukouleur Empire, ancient Ghana, the Songhai Empire, Bonu, Kanem and others. Thus, the historic development of the region had, in effect, integrated the sub-continent by establishing trans-Saharan commerce and by opening southern regions, which produced for trade gold, kola, ivory and slaves.

With the expansion of the European commercial system, the last of the great empires in this region began to crumble. The existing integration of the region gave way to the new European forces. The dividing up of the sub-continent among the colonial powers, England, France, Germany, Spain and Portugal adversely affected the area, in many places weakening and even destroying ancient social ties and currents of exchange.

The division and absorption of the area into rival European colonial networks, and the reorientation of the area's economies and peoples accompanying that shift, had created by the time of independence (about 1960) a fragmented region within a balkanized continent. Consequently, the issues of national unity and integration, and regional groupings or sub-groupings (especially economic) have been of primary concern for the francophone West and Central African countries since the time of their independence.

The complex socio-economic, political and historical setting, with the divergent policies and programs adopted by national governments since independence, are fully documented in recent academic publications, as well as in numerous World Bank (IBRD) and International Monetary Fund (IMF) documents. In the interest of basic orientation, however, we offer here a brief account of the region's major ecologic and economic characteristics.

B. The Ecological Geography

The principal eco-climatic zones (a classification based on an interrelated interpretation of rainfall records and vegetation/land use observations) are commonly referred to as the Sahara, Sudan, and Guinea zones. There are, however, no standard, universally accepted definitions or boundaries for each of these zones due to the lack of statistical records, shifts in rainfall patterns, and the difficulty of distinguishing between those areas which are naturally inhospitable and those which have been degraded through improper land use practices.

The IBRD's description of the four major zones in the Region includes both rainfall patterns and characteristic economic activity:

1. The Sahara receives less than 10 inches (250 mm) of rain annually. Apart from scattered oases, the desert is of little agricultural importance.

2. The Sahel (an Arabic word meaning "border" or "shore") receives 10-20 inches of rain annually. A vast area encompassing some two million square miles (two-thirds the area of the U.S.) extending 2,600 square miles between latitudes 10-20 degrees north, the Sahel is typically an acacia-dominated tree and shrub savannah. Northwards, there is a thinning out of trees and shrub until the desert fringes are reached. Here the herbaceous cover is of short-lived annuals. Southwards, there is a gradual transition to taller grasses, with a higher proportion of perennial species, and the incidence of trees increases. Crop production is possible in the Sahel:

millet is grown under as little as 5 inches of rainfall, and groundnuts under as little as 16 inches. Not surprisingly under such conditions, yields are very low. Pastoral operations are the zone's most important economic activity and under more or less normal conditions nomadic pastoralists in the zone maintain an estimated 19 million cattle, 29 million sheep and goats, and 3.3 million camels, horses, and donkeys. For the nomadic graziers, the Sahel represents a base which provides adequate forage for their herds during four to five months of the year; thereafter, the herds move southwards to graze in areas which, while better watered, present disease hazards in the wet season. A substantial number of breeding females and young stock, however, remain in the Sahel in a normal dry season.

3. The Sudan zone with 20-40 inches of rain can support relatively intensive systems of agriculture. Health conditions are favorable here in comparison with the Guinea zone to the south. Over most of the Sudan zone, millet, sorghum and cowpeas are the principal food crops, and cotton and groundnuts the cash crops. The possibilities for further diversification into crops such as maize and soybeans are substantial and, as pasture growth is better than in the Sahel, mixed farming is possible and in some areas is being developed. A feature of the cultivated areas of the Sudan zone is the type of parkland where scattered mature trees of economic value, e.g., the shea butter tree which produces a cocoa substitute, stand in cultivated fields.

4. The Guinea zone with over 40 inches of rain per year, is still more diverse. The zone harbors a year-round incidence of river blindness in some areas, plus other diseases. Historically, because of disease, this zone has acted, and remains, as a barrier to the permanent movement of people and livestock southwards.

Cutting across these four main eco-climatic zones are three great river systems: the Senegal, the Niger and the rivers which feed Lake Chad. The Niger and, to a lesser extent, the Senegal extend the agricultural area further north than rainfall normally would permit, although only a small fraction of the river water is used for irrigated agriculture. Mainly, the rivers support either the cultivation of rice under uncontrolled flooding or the cultivation of crops which are planted as the annual floods recede and grow to fruition on water retained by the soil. Yields are low. The potential of a fourth, smaller river system, the Volta, has largely been negated by the dehabilitating effect of river blindness (onchocerciasis).

In addition to the north-south pattern of major zones, there are often significant variations of weather and agricultural activity within a given zone. Such variations are most extreme in the Sahel and Sudan zones and are reflected in total rainfall, as well as in rainfall distribution.

After a careful review of weather patterns in the Sahel zone, particularly, in view of the recent drought, most informed observers believe that long-term climatic trends do not preclude the development of

the Sahel. The Massachusetts Institute of Technology, under an AID contract has concluded that:

1. There will be no major shifts in precipitation in the region over the next 50-100 years.

2. There will be a continuation of the major multi-annual variations from the mean, resulting in wet periods and droughts.

3. A drought of six or seven years' duration can be expected once a century; but the limitations imposed by recurring droughts of shorter duration must also be allowed for in any development plan.

Because climatic conditions have a significant influence in the determining the type of agricultural development projects which may be successfully undertaken, sector assessments for food crops and livestock presented later in this section depend to a considerable extent upon an analysis of the potential of the various zones described above.

C. Macro-Economic Overview */

1. Economic Development

a. Overall Status and Development Trends

The francophone countries in Central and West Africa Region (CWR) are to a varying degree in the early stages of development.

This is reflected in the selected socio-economic indicators in Tables A and B. Most of the population in the region is engaged in agriculture and livestock, particularly subsistence farming. Even in Senegal, which is relatively more advanced and where agriculture represents only 35% of the gross domestic product, agriculture accounts for 76% of all employment and 70% of total exports. Exports other than minerals and livestock consist of a narrow range of competing cash crops such as groundnuts, cotton, cocoa, coffee and palm oil products.

The tables also illustrate two other characteristics of the early stages of development: dependence upon either a single or two or three commodities for as much as 50 to 80 percent of foreign exchange earnings, and dependence upon foreign capital for development, in this case mainly foreign assistance. The major exception

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*/ The purpose of this section is to summarize common characteristics and problems without going into the differences among each of the 12 countries. Information on the individual countries is contained in A.I.D.'s working papers prepared for internal use, and a separate summary on the recent economic evolution of the 6 Sahelian countries.

Table A- Social Economic Indicators

	GNP		Food		Population			Education		Life Expecta
	Per Capita 1972	Annual Average Growth Rates 1965-72	Production Per Capita (1961-65=100)		Labor Force in Agricul- ture	Total Popu- lation	Annual Growth Rate	Li- teracy a)	Student Enroll- ment b)	
	($)	(%)	1965	1973	(%)	(Millions)	(%)	(%)	(%)	(Yrs.
	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9)
Afr. (ex. S. Afr.)	205	--	100	93	76	318.1	2.7	17	27	44
Cameroon**#	248	3.8	104	98	82	6.2	2.1	10-15	51	48
CAR**#	155	2.3	-	-	87	1.7	2.3	5-10	33	40
Chad*#@	85	1.6	-	-	91	4.0	2.4	5-10	14	40
Dahomey* #	103	1.7	95	92	52	2.9	2.4	20	20	39
Gabon	970	10.0	-	-	72	0.5	1.0	12	64	40
Ivory Coast#	424	4.1	100	120	81	4.7	2.8	20	37	43
Mali*#@	70	1.3	95	60	91	5.5	2.4	5	12	38
Mauritania@**#	175	2.0	-	-	85	1.2	2.3	1-5	10	42
Niger*#@	120	-5.1	93	63	91	4.2	3.0	5	6	43
Senegal**#@	285	-0.7	110	72	76	4.0	2.4	5-10	23	44
Togo**	170	3.3	100	97	75	2.1	2.8	5-10	35	40
Upper Volta*#@	70	0.6	101	62	89	5.7	2.0	5-10	6	35

Sources: Africa: Economic Growth Trends; Statistics and Reports Division; Agency for International Development. October 1974 for all indicators except column 2 (1973 World Bank Atlas).

@ Drought-prone countries.
# Identified by the UN as the most severly affected (MSA) by the recent increases in the prices of oil and other imports.
* Identified by the UN as the poorest amount the least developed i.e. "really least developed" (RLDs).
**Identified by the World Bank as low-income developing countries i.e. per capita of $300 or less.

AFR/DP/PPA:6/25/75

a) Ability to communicate in writing about matters of day-to-day conern.
b) Primary and secondary students as % of 5-19 age group.

#

Table B Trade and Financial Indicators

	Leading Exports (% of 1970-72 Total)	Trade 1974 Estimate Exports Million $	Trade 1974 Estimate Balance Million $	ODA as % of Imports a/	Public Debt Service Ratio, Pn, 1973 b/ Percent	Foreign Exchange Reserves End 1973 Million $	Foreign Exchange Reserves Year 1974 Million $	Central Government Finances Total Expenditures as % of Domestic Revenues 1973	Central Government Finances Total Expenditures as % of Domestic Revenues 1974
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cameroon	56%, Cocoa/Coffee/ alumina	486	+1	21.5	5.4	30	64	102 c/	103 d/
C.A.R.	80%, Diamonds/cotton/ coffee	65	-20	59.1	1.5	.02	.04	143	127
Chad	67%, Cotton	65	-65	45.8	4.8	1	.43	121	151
Dahomey	32%, Palm products	46*	-73	27.7	2.7	25	21	111 e/	106*
Gabon	93% Petrol/Wood/ manganese	287*	+127	27.5	7.3	39	41	92 e/	109*
Ivory Coast	69% Coffee/wood/ manganese	1,215	+245	13.7	6.3	57	66	115	117
Mali	55% Cotton/live- stock	59	-121	59.9	1.3	n.a.	6	117	121
Mauritania	78% Iron ore	200	+ 13	21.9	2.1	38	80	84	95
Niger	51% Peanuts & products	62*	- 24	66.7	6.5	43	35	116	123
Senegal	56% Peanuts & phosphates	390	- 139	22.0	8.1	.7	22	105	105
Togo	67% Cocoa/phosphates	163	+ 52	27.3	5.0	29	39	107	107
Upper Volta	58% Livestock/ Cotton	38	- 94	50.5	8.3	53	63	99 c/	104 d/

Source: Statistics & Reports Division, A.I.D. except for column 5 (IBRD).

a/ 1969-72 average gross disbursements of grants and concessional loans from bilateral and multilateral donors.

b/ As a percent of exports i.e. goods and services.

c/ 1971/72.

d/ 1972/73

e/ 1972.

* 1973

See Table A for identification of countries as drought-prone, least developed, low income, and most severely affected by increases in the prices of oil and other imports.

AFR/DP/PPA:7/3/75

is foreign private investment in mining (Gabon, Guinea and Mauritania). Industrialization within the area is still nascent owing to the narrowness of domestic markets spread over a vast area, and the small size of the monetary sector. In West Africa, the Ivory Coast and Senegal alone--mainly Abidjan and the Dakar area--previously accounted for roughly 65% of the industrial wage earners in the private sector, and about 65% of total recorded imports and exports.

Major constraints have been:

(1) Poor resource endowment, including the high risk of uncertain weather conditions in the inland countries.

(2) High transport costs, particularly in the vast land-locked area comprising CAR, Chad, Mali, Niger and Upper Volta. (These costs which have impeded regional economic cooperation and the widening of markets have made producer prices for export crops from the interior lower than those from the coastal countries. Recent transport costs have risen sharply owing to the successive increases in the price of oil imports including the quadrupling of prices in 1973).

(3) High illiteracy rates despite the spectacular rise in school and university enrollment since independence and the increase in budget expenditures that in some instances is as high as 25% of the total operations budget. (The large proportion of the population now under 16 years of age--frequently as high as 45 and 50 percent in certain countries--makes the problem all the more difficult to resolve.)

(4) The magnitude of institutional adjustments, training and skills needed to provide adequate social and economic services on the one hand, and, on the other, the magnitude of training and the social and physical inputs needed to raise the productivity of men and women engaged in agirculture and livestock or the other.

(5) The narrow tax base which, except for countries with a more favorable resource endowment such as minerals, is unable to provide enough revenue to address major development problems.

The above factors explain why economic growth has generally been lower than the average for the developing countries of Africa. The relative position of each country is reflected in the estimates of GNP per capita. (Table A)

Recognizing the long-term nature of the development effort, each country since independence in 1960 has adopted a succession of multi-year development plans to work toward growth targets and to broaden the monetary income sector. They have sought to meet these goals by expanding and diversifying their narrow socio-economic base with particular attention to the expansion of formal education, infrastructure (particularly roads), administration, and agriculture.

In agriculture, priority was initially assigned to export crops to earn foreign exchange for higher consumer and development imports. Taxes on imports became the major single source of government revenue. After 1963 the francophone countries received about $230 million in special "trade assistance" from the European Economic Community to help them compete on world markets by lowering the price of their exports to world price levels by 1967. This assistance in the form of grants to subsidize inputs or advances for price stabilization contributed to the 300% increase in agricultural exports achieved prior to the 1970s.

However, as urban population growth rates rapidly rose, dependence on food imports--especially in times of drought--increased making less foreign exchange available for productive imports. As a result of this pattern, heavy investment was made during the early 1970s in rice production to substitute for imports, and increased attention began to be paid to food production and mixed farming of export and food crops. In recent years, the area was unable to benefit fully from higher world prices for certain commodities owing to the prolonged drought. Agricultural production remained stagnant or declined in the drought-striken areas obliging some countries to divert resources that would otherwise have been spent for development purposes. The plight of herdsmen and the losses in livestock need no further mention.

Faster growth in the manufacturing and processing sector is anticipated in forthcoming years as a result of additional assistance from the European Community and France.

b. Balance of Payments Trends */

In the past, except for Mali and Guinea, there was no overall balance-of-payments pressure. The trend was a deficit with the franc zone countries, mainly France, which was more than offset by a positive balance with the rest of the world as total exports and foreign aid, other than assistance from France, rose substantially over the years. (The deficit with France in part reflected traditional ties in the provision of goods and services, and the free transfer of capital, including profits and workers' remittances, within the franc zone.) Since the West African and Central African countries respectively pooled their

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*/ For country analysis, see LDC Balance of Payments 1974-75, Agency for International Development, April 1975.

foreign exchange earnings, the countries having a large trade surplus (Ivory Coast and Mauritania in West Africa and Gabon in Central Africa) offset countries having a deficit in their trade balance or in their overall balance of payments. Mauritania has since withdrawn from the pool arrangement preferring to use more of its own resources for its own development. The importance of foreign aid in relieving balance-of-payments pressure is illustrated in Table B. Public debt servicing has generally been low since loans are usually made on highly concessional terms.

The prolonged drought and the inflationary spiral in world commodity prices in recent years, particularly food prices and the more than fourfold increase in oil, severely affected the trade balance of all countries except for richly endowed Gabon. */ The balances of countries such as Ivory Coast and Mauritania which traditionally have had a surplus were lower than they would have otherwise been. The traditionally deficit countries were generally much worse off. The earlier general pattern of increased food imports was accentuated. The region would have been in a much more critical position had it not been for access to the IMF oil facility, higher aid levels, and foreign grant-financed food imports.

c. Budgetary Trends

Development plans show that foreign assistance has financed the training of Africans and large numbers of foreign technical personnel. These costs would otherwise be a part of current budget expenditures. Foreign assistance would also have financed most of the investment in development, which would otherwise be a part of capital budget expenditures. The percent of foreign financing varies by country, of course, being lowest in countries having a larger tax base, and highest in the poorest countries, in some instances as high as 75% of development investments.

Foreign public assistance has enabled the Sahelian countries to undertake essential activities required to launch into development that they could not otherwise afford. Foreign aid has also kept budgetary deficits down, thereby preventing or curbing inflationary deficit financing. This pattern of foreign capital, a function of the earlier stages of development in which low monetary incomes limit the amount of domestic resources available for development, fails to reflect efforts to mobilize internal resources since independence.

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*/ The drought-stricken and MSA (most severely affected by the rise in import prices) countries are identified in Table A.

Immediately after independence, the Sahelian states found it difficult to raise enough revenue to finance the ordinary (current operations) portion of the budgets, owing both to the rapid assumption of government responsibilities previously performed and financed by France, and to the need to expand existing services, particularly in education, and to set up new services. Revenue for the investment (development) portion of the budget was negligible in many countries. Some governments relied on foreign resources for virtually all public sector investment. Nevertheless, revenues over time rose substantially, although never in proportion to requirements, as a consequence of tighter budgetary discipline, successive tax reforms, better tax collections, and improved operations of certain public enterprises. During 1961-66, domestic revenue in the 5 Central African countries doubled; some governments managed to double their receipts in 3 years. Similar increases occurred in West Africa, in much higher absolute amounts.

However, despite the various reform measures, generation of revenue has been greatest in countries having an easily taxable base where there was a steady increase in foreign-controlled economic activity in the modern sector (Ivory Coast and more recently Togo) and in mining and petroleum (Mauritania, Gabon, etc.). The tax base of the poorest land-locked countries is still narrow and not easy to draw upon. In some countries, the raising of taxes beyond a certain limit only serves to stimulate increases in the level of traditional smuggling instead of generating additional revenue. Examples are the consumption tax on imports, and the head tax on cattle which was always difficult to enforce and finally abolished by four countries as a result of the drought.

Cash balances from Treasury operations may be used to cover budgetary deficits and to help finance development plans. The Treasure usually centralizes all financial transactions of the public sector including those of the Central Government's budget, of public institutions such as the separate funds for stabilization, for roads, pensions and social security, and of public agencies, enterprises, and local governments. Current budget expenditures are mainly for salaries ranging from as much as 50% to more than 60% of the total. These costs have generally risen over the years more as a result of increases in staff rather than increases in salaries. Expenditures for the maintenance and equipment category appear proportionately low particularly those in support of agricultural production and road maintenance. Subsidies and other transfers appear high.

These trends presumably reflect the scarcity of resources of a growing but still inadequate economic base. Subsidies for basic consumer food commodities have spiraled in proportion to budget revenues and in many instances were heavily financed from the cash balances of stabilization funds. Data are lacking to show how much more disastrous and difficult the disequilibrium would have been in the absence of massive foreign grants for food imports and their distribution, and for other forms of emergency relief.

2. The Monetary System

a. The Problem

In principle, governments can influence the pace and pattern of ecomonic growth and development in varying degrees through reliance on several or a combination of fiscal, monetary and other policies including direct controls. However, the economic and financial dependence of most African countries on the rest of the world is so great that they do not have a great deal of latitude in pursuing an independent monetary and credit policy. Growth of the monetary sector depends upon export earnings, which are subject to fluctuations in world prices, foreign private investment and foreign aid, since the domestic production sector usually is small, and in turn relies heavily on productive and consumer imports. If an African country expanded credit more rapidly than the rest of its monetary sector, as happened in the case of Ghana, it would soon be subject to a rapid draw down, if not exhaustion, of its foreign exchange reserves. It would also make itself vulnerable to inflationary pressures upon both internal and external prices and costs, thereby reducing export competitiveness, increasing the costs of imports, discouraging the inflows and stimulating the outflows of private foreign investment in varying degree, and thus slowing down the social and economic development process. In brief, internal flexibilities for adjustment are far less than in developed countries. The extent to which central banks in the LDC's can restrain the injudicious creation of money and the management of credit that would impede or seriously jeopardize development is of vital importance.

A number of criticisms have been made about the franc zone monetary arrangements as an obstacle to the development of the CWR region. Some are valid. Others are valid in theory but invalid in practice. Some are a matter of degree. Most call for a lessening of restraints. However, in the limited publications available, no comprehensive workable alternatives have been seen so far. The loosening of restraints in Guinea and Mali which established separate central banks resulted in serious detrimental effects upon their development. Further assessment would require comparison of the CWR countries' performance with that of the central banks of other individual African countries.

b. Basic Characteristics

Both Central Africa (Cameroon, CAR, Chad, Congo and Gabon) and West Africa (Dahomey, Ivory Coast, Niger, Senegal, Togo and Upper Volta) are members of the French franc area. Each group has a common currency, the CFA franc, issued by a common central bank, the BEAC and BCEAO, respectively. Since 1973, both banks, newly renamed*, have been operating under revised treaties and statutes which are basically

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* Banque des Etats de l'Afrique centrale and Banque centrale des Etats de l'Afrique de l'ouest.

unchanged but allow for some flexibility and greater African responsibility and participation. Under a separate treaty, the BCEAO members also have agreed to the statutes for establishing a regional development bank to promote "economic cooperation"; "economic integration" and "an equitable distribution of development". The central bank may subscribe to the capital of the regional development bank.

The African States agree to harmonize overall monetary, financial and banking policy by applying the same basic principles in their legislation and regulations. Under the penalty of automatic exclusion, subject to a special review, the BCEAO group is committed to following uniform regulations regarding the use of central-bank issued currency *, the pooling of exchange reserves by the central bank, free circulation and transfer within the "franc zone" area, settlement of payments, credit distribution and control, and banking. The provisions of monetary cooperation for the BEAC group are less strict: members are not obliged to follow uniform regulations and simply agree to harmonize foreign exchange, banking, credit policies

France guarantees the convertibility of the bank's CFA into French francs. In return for this the States agree that the central banks shall hold their pooled external reserves in French francs in an operations account with the French Treasury.** Parity with the French franc is fixed (CFAF 1 = FF 0.02) with foreign exchange transactions carried out on the Paris market according to the exchange rates for the FF. (Exchange controls require the surrender of foreign exchange proceeds from exports and other transactions. Proceeds in CFA and FF may be retained. CFA and FF capital movements, and foreign currency receipts are freely permitted; capital transfers to countries outside the franc zone are subject to approval). In principle, the French guarantee to change CFAF into FF is unlimited, so that the operations account of a country or the central bank can show an overdraft. In practice, when the bank's ratio of foreign assets to demand liabilities declines to less than a certain percent for a short period of time, a series of restrictive

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* CFA franc notes issued by each central bank can be identified by country. This permits rough estimates of the circulation of each State's currency in other member States, the proportion of currency used by the private and public sectors, and the velocity of money.

** A new provision allows a certain percent (a maximum of 20% for the BEAC and of 35% for the BCEAO) of their net foreign reserves to be held in foreign currency in central banks outside the franc zone if warranted by economic trends and trade flows, and if approved by the bank's Board of Directors.

measures now automatically go into effect to prevent a sizable or continuing decline in foreign exchange reserves, and to help restore the area's balance of payments equilibrium. These corrective measures formerly carried out on a discretionary basis are not new, but their specific inclusion in the revised BCEAO statutes now formally obliges the bank to carry them out.*

In addition to issuing currency and serving as the depository of external reserves held in the operations account of the French Treasury, the central bank acts as the banker for the government, commercial banks, and other financial institutions. The central bank controls credit expansion mainly through rediscount ceilings but also through the supervision of banking.

c. Control of Credit and Banking Supervision

Overall short-term rediscount ceilings for each member state are periodically determined according to estimates of credit needs and of resources likely to be available to banks. A separate ceiling is established for each bank and rediscount limits are set for eligible individual enterprises. Short-term credit is extended in the form of rediscounts of short-term paper and advances against government and private paper. The central bank has enough flexibility to curb rapid expansion of credit unrelated to an increase in a country's economic activity, thereby curbing a decline in the country's foreign exchange reserves. However, as a general rule, the short-term ceilings, predominantly for the export of agricultural crops, have seldom been reached.

Overall medium-term rediscount ceilings are periodically determined by country. The ceilings are based on a formula applied to each commercial bank and on criteria affecting each individual private borrower. Prior approval by the central bank for medium-term financing is required.

Overall small- and medium-term ceilings as well as the allocation of the short-term ceiling among banks can be revised every six months depending on the developments in each country. In addition, the maturity of both BCEAO and BEAC medium-term credit--formerly from 2 to 5 years--has been extended to a maximum of 10 years.

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* One difference in the BEAC and BCEAO agreements is that the former not only agrees to pool foreign exchange in a common fund but also to ensure that the fund has a positive balance.

Total central bank credits to member governments have now been raised from the earlier 10% and then 15% to 20% of their ordinary budget receipts in the previous fiscal year. The revised regulations also broaden the scope of the bank's medium-term facilities for financing public investment.

Banking supervision by the central bank covers both commercial banks and individual firms. For example, the former must adhere to liquidity ratios established in such a way as to induce them to grant rediscountable credit, and to regulations designed to prevent them from providing excessive credit to customers. Reserve requirements may be imposed at the request of a member State. Strict regulations on a case by case basis determine the credit-worthiness of individual firms.

As noted under "problems" above, the extent to which CWR national governments can have autonomous flexible internal and external policies is limited. (Even national price and commercial policies cannot be independent without rapidly incurring substantial increases in smuggled exports and imports within the region, and without affecting the competitiveness of foreign exports.) The central bank regulations, particularly the quantitative and qualitative controls on credit, indicate the main reliance upon credit restrictions to obtain balance of payments equilibrium, to respond to internal demand for essential credit under conditions that permit free repatriation of remittances and investment income, and to achieve these two goals in non-inflationary ways. (Unrestricted deficit financing would have exerted inflationary pressure on the balance-of-payments. Internal expansion of money from foreign exchange earnings becomes reabsorbed as a result of the financing of imports and of capital outflows.)

The policy of highly selective credit with strict regulations governing firms and individuals eligible for the credit facilities has been non-expansionary. This policy has mainly benefited traditional foreign-owned operations, particularly those engaged in trade. The policy has not been sufficiently oriented toward development finance and toward African entrepreneurs.

d. Interest Rates

Central bank interest rates, by remaining basically unchanged prior to and since independence in 1960, and lower than the rates prevailing in France, have encouraged the predominantly foreign private sector to borrow scarce capital in the BEAC and BCEAO area and deposit the funds in the French market. The recent increases in central bank rates signifies that the banks are now taking consideration of the interest rates prevailing in France as part of their credit policy. Although the special relationships of the zone including the free movement of capital transfers and other factors limit the scope of an interest-rate policy, the changes reflect experimentation with the rates as an instrument of economic policy. Higher interest rates will lessen the pressure on the central

banks' daily operations, and, if judiciously applied, will in the short-run improve the balance-of-payments position of the more monetized countries. In the long run, appropriate interest rates will (1) encourage middle- and higher-income Africans and foreigners to transfer less funds to France and to invest more in financial rather than non-financial forms of savings, (2) alter the pattern of rationing credit, including the increased availability of private funds for the public sector, (3) stimulate monetization of the economy, and (4) as in the case of the Ivory Coast, lead to the development of a capital market.

D. Drought and the Case for Assistance

1. The Drought

Over recent years, the world has become aware of the catastrophic drought in the Sahel. An area of delicate ecological balance, one of of the least developed regions of the world, the Sahel is dependent on sparse and variable rainfall for all forms of life. Following dry years between 1968 and 1971, a sharp decline in rainfall and agricultural production in 1972 and 1973 left destitute large numbers of people in Senegal, Mauritania, Mali, Upper Volta, Niger, and Chad.

The Sahel has experienced multi-year droughts before. A severe one occurred 50 years ago, and there have been periodic droughts since. But the recent situation may well have been the worst drought in history. It certainly constituted a catastrophe of major proportions. The U.S. Center for Disease Control in Atlanta, Georgia undertook a nutritional survey in 1973 which estimated that as many as 100,000 persons may have died. International experts have estimated that perhaps 40 percent of the goats, sheep, cattle and camels, on which much of the economy and social structure rests, have fallen victims to the drought, either through death, premature slaughter, or early sales.

The first concern of international action was to save lives. Food, medicine, tents, blankets, medical teams, were shipped quickly, in quantities larger than the region had ever before known. On occasion aid moved faster than systems could be organized to control its flow. In the first year of operations (1973), lack of knowledge and enormous problems of transport and communications meant that aid did not reach all those in need. In the second year, that aid effort was vastly improved. Whereas the relief efforts were essential, they were naturally not enough to secure the existence of the Sahelian people. The drought has had a profound effect on the region: a fundamental weakening of the ecological base, disruption of social and economic relationships, and the changing of basic ways of life.

There have also been many spillover effects of the Sahel drought in adjacent areas, both climatically with the familiar diverse effects on agricultural production, and in numerous other ways, including population pressure from migratory movements and the extensive pressure on transport systems caused by the massive food shipments to the Sahel.

For all these reasons, the African governments and the donor community, while seeking to meet the immediate needs of the Sahel's people, have also begun to seek answers to the underlying ecological and economic problems of the region. Only if these answers are found and investments made to bring basic change to the region, can a repetition of the disaster be avoided in the future. AID's approach, in consort with that of the Africans and other donors, has thus been first, to provide necessary emergency relief, and second to undertake activities that can help alleviate immediate shortcomings in agricultural production and infrastructure. With the preparation of the present document, AID has begun to seek ways to assist in laying foundations for future, comprehensive development.

2. The Case for Assistance

In addition to humanitarian considerations, the donor community in recent years has been giving increased attention on how to provide more assistance to the poorest ("really least developed") countries. Poverty and growth consideations for the lowest and low-income countries have become all the more acute as a result of the current disequilibrium in the world economy. Some countries have become "most severely affected" (MSAs) by the increases in the prices of oil and other essential imports.

The deterioration in the terms of trade caused by the increase in the cost of petroleum is particularly serious for the CWR countries, all of whom except Gabon rely completely upon oil imports. Expansion and diversification of exports is a longer-term adjustment. Meanwhile, the prices of many or all of some countries' major commodity exports are forecast to decline in the next five years, a decline which has already begun for several commodities. Although projections indicate a decrease in the costs of food imports, the prices of manufactured imports, including products with large petroleum inputs, are not expected to decline.

The internal repercussions of the current crisis compounded by the drought are still being felt throughout the CWR area. The shocks were severe in countries where transportation costs already had been a substantial component of the prices for imports, exports, and domestic output. They were particularly severe in the more fragile economies.

Table C: CWR Countries Categorized According to Need

	Disaster-Prone	Really Least Developed[a]	Most Severely Affected[b]	Low Income[c]
Africa[d]	10	16	26	18
CWR	6	5	10	5
* Chad	x	x	x	
* Mali	x	x	x	
* Niger	x	x	x	
* Upper Volta	x	x	x	
Mauritania	x		x	x
Senegal	x		x	x
Dahomey		x	x	
Cameroon			x	x
* CAR			x	x
Togo				x
Ivory Coast			x	
Gabon				

* Landlocked.
a/ UN definition: 1971 per capita of $100 or less.
b/ UN definition: April 1975 status.
c/ Per capita income of more than $100 but less than $300.
d/ Excludes North Africa.

Source: Table A.

As a result of the crisis, there is growing recognition that the dislocations are such as to require both increased transfers of real resources, such as the financing provided by the IMF's facilities and the donor community, and structural adjustments. The latter include changes in domestic policy, new policy instruments, and the necessary reforms to obtain maximum use of human, natural, and financial resources, particularly among the countries of extreme poverty.

The impact of the drought in the Central and West Africa region had already led to the realization that the possible steps for a permanent restructuring of the agriculture sector to increase export and food production and generate incomes could not be delayed, and would require changes in prices and other policies affecting the rural sector. The need to adjust to the world-wide economic disequilibrium (the "energy crisis") dramatized the urgency of moving forward in a region which will have considerable potential. It can become economically viable as manpower is trained, as river-basin and rain-fed land development permit rational utilization of resources, as endemic disease control is extended, as absorptive capacity is expanded, and better economic management is obtained.

3. The Terms of Assistance

a. Concessionary Assistance

The selected CWR data in Tables A and B, partially repeated in Table C, are simplified indicators of the poverty levels and stage of development, of the capacity to earn foreign exchange to pay for imports, of the domestic capacity to increase production and to generate savings for development, and of the magnitude of official development assistance in the development effort of the various countries. The summary indicators can easily be buttressed with additional information to elaborate on relative country differences, assistance needs, and debt-servicing capacity.

The low debt servicing capacity for many of the countries explains why public debt service ratios have remained low, (Table B, Column 5) and why concessionary assistance has tended to be higher than for other regions. Thus, development grants and concessional loans (Official Development Assistance) as a percent of total bilateral public assistance has generally been higher than the 1972 DAC average 87% for developing countries. Similarly the grant portion of ODA has always been much higher than the amount of concessional loans. The grant element of ODA loans, a measure of the softness of loans according to their grace and maturity periods and the difference between the actual and commercial interest rates, has normally been much higher than the 1972 DAC average of 84%. Furthermore, the grant element for the poorest CWR countries has usually exceeded the 90% target recommended by DAC in 1973.

Gabon has clearly passed the need for concessional aid. Gabon's per capita income of about $970 in 1972, which was the highest in Sub-Saharan Africa (higher than in South Africa), is now well over $1,000 largely as a result of oil exports. Gabon, Ivory Coast and to a lesser extent, Senegal, have been able to borrow from the Euro-Dollar market.

However, these loans have been for commercially profitable activities of a dual economy. They are distinct from the investment needed for manpower and for the structural changes to increase productivity and incomes and reach larger segments of the rural population.

Since the grant percentage and loan terms have been highly concessionary all along, recommendations for continued favorable terms of assistance should raise no particular problems. However, these terms should be followed on a country-by-country basis in relation to trends in the key indicators of the economy, including changes in financial and fiscal capacity.

b. Local Cost Financing

By contrast, recommendations for local costs financing do raise problems. As a matter of general policy, a number of donors do not finance such recurrent local expenditures as current administrative, maintenance, repair and operating costs. These donors expect host governments to finance either the majority or a gradually increasing portion of the local costs to implement new projects. In the case of the United States, the use of funds for recurrent costs has been tightened with a strong justification now required regarding such uses. Current U.S. legislation requires a host government to contribute a minimum 25% of the total cost of any project, either in local currency or costs in-kind. In the case of the European Community, protocol 2 of the ACP-EEC Convention of Lome will permit temporary financing on a diminishing scale of the running costs or major repairs of EDF-financed projects of special importance to the development of the least developed (RLD) countries. These exceptions are decided on a case-by-case examination of the needs and means of each country.

Donor policies on local cost financing were designed to ensure that any foreign-funded activity undertaken was of priority interest to the host government and would have lasting effective results after the recipient assumed complete responsibility. However, it does appear that donors will be able to obtain some flexibility through special measures or waivers in the case of the disaster-prone least developed countries. Presumably the exceptions will be based on a dynamic as distinct from a static analysis of the appropriate factors for each country.

II. External Assistance to the CWR Region

A. Other Donor Assistance

Current trends in ODA assistance and the 1973 distribution of assistance by recipient are summarized in Tables D and E. In contrast to the immediate post-independence period when France was the principal donor owing to its special relationship with the francophone area, the number of donors and the amounts of their aid have increased over the years. In 1974, the region benefited from higher contributions from the oil-producing countries, although some of these activities will be implemented over a long period of time. Meanwhile, Canada has already made a substantial $230 million five-year commitment to the drought-stricken countries. In future years, the MSA-least developed group in CWR are expected to benefit from both larger contributions and special measures under the European Community's new convention. The level of interest-free IDA loans is expected to be maintained, and increased as the project design phases are completed. Non-concessionary IBRD loans are expected to continue to be made either separately to the higher income countries or in combination with soft-term loans and grants from other sources. The volume of U.S. assistance will increase in the immediate future.

As shown in Table E, the Central and West Africa region, comprising 14% of developing Africa's population, received 36% of total aid to Africa exclusive of Communist aid. This magnitude (Table D) reflects not only the special role of France and relations with the European Community, but also the sustained and increasing interest of other bilateral and multilateral donors in the development needs of the region.

French bilateral aid consisting mostly of grants is largely channeled through the budget of the Ministry of Cooperation which mainly provides for French personnel (about 50% of total expenditures) and the financing via FAC (Fonds d'aide et de cooperation) of projects that are nearly equally divided between activities that are part of each country's development plan and activities of general interest. Projects under the first category are principally in the broad area of rural development and infrastructure. Projects under the second category include economic and technical studies, research in agriculture and mining, cultural and social activities, and equipment for schools and universities. French technical assistance has strongly supported primary and secondary education in these countries, where school enrollment has increased at astounding rates, as well as various forms of informal training in rural areas, particularly "animation rurale" and extension work.

A separate agency, the Caisse Centrale de Cooperation Economique (CCCE), is the major source for loans. During 1973, CCCE loans equivalent to $75 million were made for public infrastructure (28%), housing,

Table D. Current Trends in ODA to Central West Africa*
Commitments in Million $

	CY 71	CY 72	CY 73	CY 74 est.
Total 1/	607	661	948	1,319
Bilateral	**368**	**434**	**634**	**844**
France	286	327	414	
Germany	28	40	68	
Canada	15	28	48	
United States	34	15	33	
Other 2/	5	24	20	
Oil Producers	-	-	51	
European Community	**160**	**138**	**220**	**220**
Multilateral	**79**	**89**	**94**	**255**
IBRD	28	24	20	73
IDA	26	48	52	96
UNDA	22	13	9	-
Other UN	1	2	5	
AFDB	2	2	8	
Oil Producers	-	-	-	

*ODA (Official Development Assistance) includes developmental grants and concessional loans. However does includes non-concessional IBRD loans. Excluded are Congo (B), Guinea and Madagascar.

1/ Total excludes Communist aid which respectively was $22 m., $89 m., $161 m., and $46 m.

2/ Comprises 13 other DAC Countries.

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Table E Official Development Assistance to Central West Africa - 1973*
Estimated Commitments in Million Dollars

Country	Total	Total Bilateral	Bilateral and EEC Assistance			Total Multi Lateral	Multilateral Organizations				
			U.S.	Other Bilateral	EEC		IBRD/ IDA	IFC	UNDA	UN Agencies	AFDB
Total Africa	2662.8	2158.7	203.9	1639.4	315.4	504.1	408.1	8.7	46.3	16.2	24.0
Total CWR Region	952.3	858.6	33.7	604.8 a/	220.1	93.7	72.8	-	8.6	4.6	7.7
Cameroon	70.8	64.8	0.7	38.8	25.3	6.0	1.7	-	0.8	0.5	3.0
C.A.R.	49.0	47.5	2.9	27.0	17.4	1.5	-	-	0.5	-	1.0
Chad	52.3	52.1	0.9	37.6	13.6	0.2	-	-	0.2	-	-
Dahomey	20.0	19.2	0.7	15.9	2.6	0.8	-	-	0.5	-	0.3
Gabon	32.8	22.7	0.1	21.9	0.7	10.1	9.5	-	0.6	--	-
Ivory Coast	121.2	111.8	1.8	86.8	23.2	9.4	7.5	-	1.4	0.5	-
Mali	93.5	74.9	12.8	31.1	31.0	18.6	16.2	-	1.2	1.2	-
Mauritania	34.7	33.6	1.5	14.3	17.8	1.1	-	-	*	0.3	0.8
Niger	74.0	72.1	5.2	44.6	22.3	1.9	-	-	0.3	1.6	-
Senegal	133.3	91.4	2.3	63.6	25.5	41.9	37.9	-	1.2	0.2	2.6
Togo	41.1	40.0	1.6	25.0	13.4	1.1	-	-	0.8	0.3	-
Upper Volta	54.0	52.9	3.0	33.3	16.6	1.1	-	-	1.1	--	-
Undistributed	142.1	142.1	-	-	-	2.1	-	-	-	-	-
Regional	33.3	33.3	-	22.6	10.7	-	-	-	-	-	-

* Bilateral Assistance is by calendar year, and multilateral assistance by U.S. fiscal year.
a/ Approximate commitments in million $ were: France 414, Germany 68, oil producers 50, Canada 48, and other non-communist donors 24.

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industry and tourism, agriculture, and electric power (about 20% each). Roughly 80% of the loans were combined with other public and private funds of local and foreign origin, amounting to a capital investment of $247 million. The CCCE is shifting the composition of loans and altering the pattern of agencies through which loans are channeled (public, semi-public and private) to adjust to the current development needs of the CWR.

The European Community's European Development Fund, known as FED (Fonds europeen de developpement), is the second largest donor. FED budgets cover a four-to-five year period: 1959-63, 1964-69, 1970-74, with the allocations for each successive period substantially increasing. Grants predominate, averaging about 85% of the total. Assistance has mainly consisted of basic infrastructure projects such as roads, railroads, ports, water supply, schools and hospitals. However, special attention has been increasingly paid to the agricultural sector. Under the 1964-69 Yaounde Convention, a special trade assistance component of $230 million was added to $500 million for regular projects in order to improve and diversify agricultural production so that exports could compete with world market prices. The CWR area was the principal beneficiary of both forms of aid. In recent years increased emphasis has been placed on packaged inputs (fertilizer, seeds, draft oxen, etc.) for both food and export crops. EDF programs are broad and flexible as evidenced in the new ACP-EEC Lomé Convention.

The EDF has been particularly responsive to food and other emergency relief needs caused by the drought disaster which affected some countries as early as 1968.

Increases in World Bank Group loans (IBRD, and IDA's interest free loans) are primarily for the agricultural and livestock sectors. As noted earlier, the practice of combining IBRD nonconcessionary loans with grants and concessional loans from other donors in large-scale projects eases the hardness of IBRD interest rates and the debt-service burden.*

Communist aid (Table D) has been for a variety of purposes: a dam for the Cameroon, port construction in Mauritania, rural electrification, etc. 1973 marked the first time Cameroon, Senegal, and Upper Volta became the recipients of aid in the form of interest-free loans from the People's Republic of China. A number of Communist countries donated modest amounts of food to the drought-ridden countries during 1973 and 1974.

The assistance provided by donors contributing less than $70 million a year (1973) is omitted from this summary.

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* In late July 1975, the IBRD approved adoption of a "third window".

B. Past U.S. Assistance (Non-Emergency)

During the 1950's and the early 1960's the U.S. practice was to provide bilateral assistance programs to virtually all developing countries, including the newly independent countries of Africa. In March 1963, the Clay Report recommended limiting economic assistance programs to Africa, and, in 1966, an Amendment to the Foreign Assistance Act restricted development grants to 40 countries and development loans to 20 countries. These restrictions on AID programs led to a reduction of bilateral programs in Africa. The review of Africa programs resulting from this process led to the Korry Report which recommended limiting bilateral programs to 10 "emphasis countries" in Africa, for which developmental prospects were brightest and in which the U.S. had comparatively great national interests.

Based on the above policy considerations, AID's Africa program in 1967 moved towards concentration on overall economic development in a selected number of "emphasis countries". At the same time, AID sought to strengthen regional institutions (e.g., the Entente Fund) to build new multi-country technical organizations (e.g., The International Institute of Tropical Agriculture, IITA, the West Africa Rice Development Association), to finance capital projects having regional implications (e.g., regional road or communications links), and to participate in the multi-donor financing of capital projects in the so-called non-emphasis countries (e.g., Trans-Cameroon Railway).

More recently, within the limits of legislative restrictions, the U.S. has developed programs which link regional and country elements more closely. The U.S. has also sought to come to terms with well defined technical problems which are shared widely throughout Africa, particular problems in the fields of agriculture, health/family planning, and human resources development.

The countries included in the AFR/CWR program were not designated "bilateral emphasis countries". As a minor donor to this area with limited interests, AID had neither the mandate nor the resources to fully engage African governments and other donors in broad developmental programs.

Over the past two years, however, a substantial shift in the magnitude of U.S. resources allocated to this area has occured. This shift, which is still underway, has been stimulated by various considerations presented in preceding pages:

-- The Sahelian drought as a specific problem affecting the survival of millions of peoples;

-- The association of the Sahel with many of the Really Less Developed Countries (RLDC), landlocked countries, and those Most Severely Affected (MSA) by the food/energy crisis;

-- The growing international interest in addressing resource management problems of semi-arid lands.

C. Emergency Assistance and Post-Emergency Coordination

The requirement for close cooperation in the CWR Countries among external donors, as well as between donors and recipients, became immediately apparent during the first months of international drought emergency assistance to the area in 1973.

The size of the Sahel emergency operation was determined in part by the size of the affected area, 2,600 miles in length and some two million square miles in extent. Complicating the task still further, however, was the dispersed nature of the population and the paucity of roads, railways, and airstrips. In logistical terms, the Sahelian relief efforts was unprecedented in the history of international relief operations. The U.S. contributed 40 percent of the total food and supplies donated by the international community, including the U.S. Air Force airlift capability which was particularly crucial in the first year (1973) of the operation. The U.S. contributed $26 million in total aid (including $22 million in food aid) in FY 1973.

Following the first year of relief deliveries, the U.S. and other donors promoted small Relief and Rehabilitation activities to alleviate immediate shortfalls in agricultural production and infrastructure. U.S. R&R Assistance to the Sahelian States, together with $75 million in food donations, totalled $95 million in FY 1974. In March-June 1974, AID teams together with the local governments designed a series of larger, mid-term projects in food and livestock production, with payoffs anticipated beginning three to five years after initial implementation. Of the $85 million authorized by Congress on July 6, 1974, for the drought-stricken peoples of Africa, an estimated $68 million will have been used in FY 1975 in the Sahelian states for R&R and mid-term activities and continuing emergency actions.

Beyond the emergency and rehabilitation phases, however, the U.S. Congress has determined that the United States shall also contribute its fair share "toward the development and support of a comprehensive long-term African Sahel development program" (Foreign Assistance Act, Section 639-B). It was this directive which has made possible the present study.

The same Congressional mandate also urged, at the same time, that the U.S. lend its support to the formation of an international partnership for Sahelian assistance. Given the very nature and condition of the Sahel, requiring the exploitation of the region's great river systems, post-drought construction promises to be lengthy (20-30 years), costly, and complex. Unprecedented cooperation between the Sahelian governments and international donors alike will be needed. To this end, the U.S. has held and will continue to hold, bilateral talks with

the governments of the Sahelian region and with principal donor organizations. On January 23-24, 1975, detailed discussions were held with top officials of the French aid program, continuing an annual series started in 1969. Post-drought consultations have also been undertaken with the European Development Fund (FED), the West Germans, the U.N., the World Bank, and the Canadians.

Still, in view of the complexity of programs required, the need remains to institutionalize a long-term, multi-donor effort in the Sahel. To give an example of the magnitude of measures under review, the OMVS program, which is envisaged to make full use of the Senegal River, plans a series of dams, power generator systems, locks and river port facilities costing $350 million in the 1975-1982 period (Phase I) alone. This price does not include the cost of training management personnel and technical experts, as well as preparing the thousands of everyday users of related farm irrigation networks in Senegal, Mauritania and Mali. As Section Two of this paper will show, proposals of comparable scope may be expected in the Niger River Valley and in the Lake Chad Basin, although these plans are not currently so well developed. The special coordination of donors will also be required in multi-year programs of agriculture research, in the controlled application of research findings, and in the wide dissemination of proven seeds, implements, and farm management systems.

On January 30, 1975, the Chairman of the Development Assistance Committee of the OECD, at the request of the U.S. and French Governments, convened an informal session of donors to the Sahel to discuss methods for achieving closer coordination in the long term development of the region. Participating governments at the meeting reviewed suggested forms for a consultative group arrangement for the Sahel, including a permanent Secretariat chaired jointly by a donor group (like the European Economic Community or the World Bank) and an organization representing the recipient governments (like the Permanent Inter-State Committee to Fight the Drought in the Sahel - CILSS). The donors deferred any decision on the exact form which a coordinating body should take, pending consultations with the participating recipient governments and following more detailed discussions among themselves. Another meeting which will include the recipient states will then be convened. There appears to be a consenus forming, therefore, that an overall coordinating body of some form is required to carry out long-term development in the Sahel and contiguous areas.

Given this interest on the part of the international donors, the establishment of some form of special development fund for the Sahel would seem propitious. The natural and size of the Sahel fund could be determined by donors and recipients over the course of the next year. Such a fund would not substitute for all regular bilateral programs, although some of them such as the proposed U.S.-financed Senegal River irrigation programs, might be incorporated into it. Rather, the multi-year fund could serve as a device to focus world attention and resources on the

larger, long-term investments, suggested above within the spheres of River Basin development and agriculture research. The activities will be required if the Sahel is to achieve some form of economic viability. In addition, such a multi-national fund could serve to depoliticize the assistance rendered and by-pass some of the vaguaries of bilateral aid. The effect would be to encourage local governments to undertake essential project-related measures (e.g., tax reform) which otherwise might be deemed too sensitive to be associated with foreign-funded development activities.

While donor countries have been meeting to work out forms of coordinating their assistance, recipient countries have also formed various associations to assist in the resolution of regional problems and in the coordination of development assistance:

1. To manage and develop shared resources; for example, the Senegal River Basin Organization; the Niger River Commission, the Lake Chad Basin Commission;

2. To deal with common sectoral policies and problems: for example, health problems (OCCGE and OCEAC), livestock (Entente Livestock Community), grasshoppers, birds, and locusts (OCLALAV); scientific and technical problems (STRC); and manpower development (PAID and CAFRAD), and water resources planning (CIEH);

3. To provide financial and planning assistance: for example, the Entente Fund; and the African Development Bank;

4. To assure cooperation on financial and monetary matters through a variety of monetary and customs unions; and

5. To deal specifically with problems associated with the drought and environmental problems through the Permanent Interstate Committee to Fight the Drought in the Sahel (CILSS).

III. Recommended Guidelines for U.S. Assistance

A. Planning Strategy

The Sahel experience has created a heightened consciousness of the tremendous impact which ecological factors have on development. It has further raised serious questions about the capacity of traditional assistance programs to address significantly this kind of critical problem. Indeed, in some instances, assistance programs have inadvertantly accentuated the ecological imbalance which has contributed so much to the dimensions of the current disaster in the Sahel. Animal health programs and water development activities are examples of well-intentioned efforts in this region which led to serious over-grazing of communal grasslands. Moreover,

most of these programs have had only a marginal effect at best on the lives of the people, changing very little the basis of their economy or the factors which tied them to a largely subsistence-level income. In times of prolonged drought, in which years of capital accumulation are wiped out and people are thrown suddenly upon outside aid for survival, these past programs have seemed irrelevant.

What has become clear is the need for development programs to begin to address substantively the problem of ecological imbalance; without such attention, development becomes a moot issue. It is also clear that to make a difference in the life chances of people, investments in the area must be substantial enough to have an impact upon large numbers of people and on the land areas which support them in a critical way. To be effective, these investments must change the basic character of the economy so that it will no longer be at the margin of survival and subject so completely to the adverse effects of nature. It is precisely because the character of the ecology is dependent upon the individual actions of the millions of its inhabitants that technology must be introduced which serves not just a small, select group of people, but broad numbers of people throughout the region.

B. Assistance Goals

Put in its simplest form our overall goal for the Central/West Africa Region should be to help increase the local agricultural production capacity and so to wipe out the food deficit,while placing maximum concentration on social and economic equity. This goal entails the strengthening of the agricultural base to render it more resistant to the threat of drought, as well as more productive and profitable. Because the great food deficit has directly affected so many of the poorest segments of these societies, the equity issue is of paramount importance. But in striving for equity agriculture programs must not fail to close the overall food gap in the area. Both extensive and intensive programs will therefore need to be developed for overall goal achievement.

A parallel and supporting goal to the equitable increase of food production is the imperative halting and reversing of the ecological deterioration which is occuring throughout the CWR area. Conservation of land and water resources is an essential prerequisite to restoring the area's ability to feed itself. Continuing environmental damage will undoubtedly mean continued deficits and the increasing demand for food from a small group of developed countries with rapidly shrinking supplies. Naturally in this regard, the Sahel is the focal point in the region. The Sahel is the area that has suffered the greatest environmental damage and is the home of some of the world's poorest people. Continued deterioration in the Sahel could threathen the production base of the coastal states further south by compressing populations there and causing over-cropping. The Sahel therefore constitutes a very special geographic area meriting special kinds of assistance. Decisions as to where assistance programs should be

located within the CWR region, however, should be based upon the actual location of people and the real opportunities which exist for assisting them.

Given the very delicate ecological balance in the Sahel, standard development interventions, for example, in range and water resources, under the best of circumstances could inadvertently exacerbate ecological imbalances and could prove destructive. It should therefore be expected that programs aimed at both food production and ecological reclamation in areas of marginal natural resources will cost more, will be more difficult to manage, and will take longer to execute than projects in more ecologically stable areas. Careful planning and the step-by-step evaluation of the environmental effects of programs will therefore be more than necessary. For investments which must fundamentally alter the human environment in expanding the now narrow margin of survival, traditional cost/benefit tests of project effectiveness may need to give ground to new, less quantifiable methods of analysis.

In designing assistance projects, we should seek multiple benefits. Along with improving the quality of life and increasing food production and availability, the programs should also expand the ability of people to make more meaningful decisions about the direction of their own lives. The expansion of human options will probably be reflected in programs that lead to multiple rather than mono-resource conversion.

We therefore recommend an assistance strategy composed of four concurrent main elements:

1. "Extensive" programs aimed at bettering the life situation of the rural segments of these societies, specifically the small cereal cultivators and pastoral herdsmen who form the vast majority of the population most affected by drought and most restrained by the paucity of development opportunities. These programs would involve the widest possible distribution of low cost, low risk, moderate technology with a high degree of human participation.

2. "Intensive" programs aimed at converting major resources and major natural resource areas into important food and cash production returns in order to close the food deficit gap in the region. The role of cash crops should be examined along with that of food crops in multi-cropping schemes. These programs would be designed to significantly transform existing environmental/production situations into an established foundation for longer term production.

3. Programs aimed at arresting and reversing the progressive deterioration of the physical and human resource base. In the program process, people must be given a greater capacity for enhancing their living conditions.

1-3. Programs selectively aimed at improving the administrative and management capacities of national and local governments and other institutions to meet priority social and economic development needs.

It is important in conceptualizing a strategy for the CWR area that we keep these program elements in a complementary perspective; otherwise they could appear to be in conflict. We conclude from the DAP exercise, for example, that the U.S. must both continue to assist in increasing food production in dry land and currently irrigated areas (while being prepared to respond with short-term R&R activities where appropriate), and embark upon assisting the expansion of the productive resource base through river basin development.

Further guidelines for U.S. assistance to the area, touching on the issues of long vs. short-term assistance, and regional vs. bilateral programs, will be offered in the introductory portions of Section Two, immediately following page 92.

IV. Sectoral Overviews

The individual country sector assessments contained in the annexes provided us with sufficient analysis to make certain programmatic judgements, both regionally and bilaterally. These program conclusions with estimated funding needs for FY 75 and FY 76 are contained in Section II of the DAP substitute. However, to provide a sectoral and key problem focus for those program recommendations, it is important to draw certain sectoral conclusions about the region as a whole.

A. Agricultural Sector Overview

Generalizations on the subject of rural development are exceedingly difficult. The interactions among policies, institutions, trained manpower, physical resources and technology are complex and immensely diverse. There is not a single solution (or package) which is universally applicable. Nor is there a systematic framework for analysis. We make the assumption that our skills are adequate to the task and that insights, if not complete, are in the right direction. We also assume that the objective of rural development is to reach the bulk of that sector's population in a manner which will insert viable processes that will in the end become self-sustaining. We hope the thrust of the DAP agriculture section is in that direction.

The DAP exercise attempts to cover all of the former French territories south of the Sahara in which the United States operates assistance programs. This embraces 12 countries. These countries have few points in common among them, except that of dispersed populations which are poor, illiterate and in ill-health. In recent years, none of these countries has been able to feed itself. Whereas population has, on the average, advanced at 2.5 percent per annum since independence, annual production has lagged with less than one percent increase annually. The deficit has been made up by food imports.

The drought-prone Sahelian belt lies athwart the whole region. The present drought appears to have lost its grip. The drought did serve to rivet world concern upon the area and for the first time substantial levels of foreign assistance became available--financial and technical, as well as humantarian assistance. But to imagine that the Sahelian states are no longer cereal deficit countries just because the rains appear to have returned would be an error. In the Sahel there is a 20 percent chance of complete crop failure every year. There is perhaps a 40 percent chance for a mediocre crop. It is true that the crisis elements of the drought--human deprivation; widespread, if uneven, losses of livestock; the seeming advance of the desert--appear to have abated. But the sapping effect of the past half decade of drought lingers on.

From an agricultural development standpoint, nevertheless, West African states are much stronger and certainly wiser than they were a

decade ago after the first flush of independence. The subsistence subsector is no longer taken for granted. A much better, if imperfect, understanding of indigenous agriculture exists. A worldwide system of crop technology research has come into being which is beginning to have meaning for this agriculture. Local governments have become more sophisticated in their perceptions of problems and in their planning of ways to meet them. Sufficient experience exists on the part of both the host governments and their donors to approach rural development with some confidence, although this maturity reflects a large number of false starts. The final resolution of fundamental problems of rural development and in particular the production of adequate and reliable food surpluses nonetheless remains a distant hope.

The separate country studies appearing in Section III examine the problem of agricultural development in considerable detail and these appraisals vary. Yet, some general statements can be ventured. Central in every case is the problem of basic food production. Will these countries remain international wards? Will they become even more dependent upon investment-robbing food imports? The nub of the problem is the ability of the traditional sector to supply urban cereal needs and still be able to satisfy its own needs, while continuing to produce commodities for export. So long as no change in food production technology occurs and becomes widespread, cereal production and commodity production will remain substitutive: each can expand only at the expense of the other. For the Sahelian states the problem is especially nettlesome in that commodity exports figure so large in their total foreign earnings. In Chad, 70 percent of foreign exchange comes from the export of cotton by the cotton monopoly. For Mali the figure is 30 percent; Niger, 60 percent; Senegal, 50 percent; Upper Volta, 30 percent. There are few alternative sources of foreign exchange for these governments. Livestock, for example, although important in national accounting, is sold almost entirely through private channels. Governments are thus able to tap into the trade only by covering head taxes and some loosely applied export taxes. Minerals, including petroleum, are of varying importance. Mauritania and Gabon depend almost entirely upon them. The other countries nourish hopes of discovering valuable deposits, but as yet have only small extractive sectors. So long as farmers play such a vital role in the earning of foreign exchange, governments will have to be chary of policies which may reduce the production of commodities, even if they must sacrifice for that the greater production of food.

New food production technologies are becoming available. Promising millet, sorghum, corn, root crop and rice varieties, suitable to local conditions, are beginning to appear. Certainly over the next five to ten years much will flow from present breeding programs. The principal difficulty, as yet grossly underplayed, is the problem of adapting the most appropriate known technologies to the existing systems, while conducting research to develop new technologies and farming systems. In the long-run, certainly, planners are going to have to content themselves with improvement within the traditional system, making it produce up to its potential. In very few places

in Africa do the conditions exist which will act to transform this sytem into a modern commercial agriculture. Any new technology, to be acceptable to farmers, must satisfy three criteria: (1) it must be adaptable technically to given circumstances; (2) it must be economically profitable; and (3) it must involve a tolerable risk level. In addition, the innovation must fit into the technical-cultural milieu, which is oriented towards group survival. In these countries social relations play an important role in survival strategy; these relationships are too often played down or discounted entirely by planners as being archaic relics which should best be terminated since they represent impediments to rapid change.

The three above criteria are of particular importance in connection with the U.S. interest in stimulating activities which will be of benefit to the "small" farmer. A great deal of research remains to be done in this area; first, to identify activities which are relevant to the small farmer, and second, to structure these activities so as to help him become more productive. We are still unsure, in an African context, of just who our client group is. Are all "small" farmers of equal interest to us? Or, failing this, which category of rural people ought to have first claim on our aid resources?

Doubtless, given unlimited resources, schemes could be planned which would at a stroke make available more advanced technologies, more extensive supply and assembly systems, and better extension services and marketing systems for all African producers. Lacking such resources, we must make a careful selection both of target groups and of methods of intervention. Ideally, these interventions once established should become self-financing. They should provide a stream of income which can be spent or invested by farmers and taxed by government. They should also help meet some of the larger needs in the present national economies: to substitute for presently imported commodities, for example. Our interventions must economize on resources scarce in the recipient country--skilled manpower, recurrent finance and equipment--or else we must provide these ourselves.

In the particular case of farm development, criteria for our target group must be prepared. We need to develop concepts of a potentially viable farm under various local circumstances. Then the gap between potentially viable and the actual may become a basis for projects design. Three criteria for farm viability are of paramount importance: (1) soil quality and moisture; (2) access to markets; (3) adequate source of farm energy. If one's objective is to encourage self-sustaining rural development, then little benefit is derived from costly farm schemes in poor terrain remote from market transport -- no matter how needy the people. People in such circumstances should be either encouraged to move,

provided subsistence maintenance, offered technical supports meaningful to their situation, or passed over for the time being. If adhered to, these criteria must focus our programmatic attention to areas where development payoffs are more likely. In this connection, it is worth recalling that a program which could affect in some permanent way only an additional one percent of a country's rural population annually would constitute a success almost without precedent.

Existing farm systems in this region (as indeed in all of Africa) are very energy deficient. Human energy is typically short during peak periods of land clearing, land preparation, and subsequent weeding. Any new technology which requires extra labor (such as rice or cotton cultures which need special ridging or land levelling) is going to be viewed very critically. New technologies must raise human productivity. Alternative energy systems--animal or internal combustion--will only make economic sense under certain conditions, not commonly prevalent. Few farmers have sufficient cash assets to buy costly inputs or to support technologies which require continuous cash outlays. In northern Cameroun, per capita cash incomes are estimated at $12 per annum. In Niger, the same measure is $17. Cash income is likely higher in Upper Volta, where many farm families have members working abroad, or, as in Senegal, where perhaps half of the farmers sell peanuts. In Mauritania and Mali, however, the figure is certainly not much different from that in Niger. The cash constraint affects farmers' ability to utilize fertilizers, tools, pesticides, hired labor or draft animals, either as new or extra inputs, unless their economic returns are immediate and credit is available.

Any new technology must be linked with commercialization. Hitherto, marketed crops in the region have been mostly export commodities. Local governments have held urban food prices too low to offer farmers much incentive to increase the production of food. Partly as a result of low urban food prices, partly as a function of inadequate transportation infrastructure, the commercialization system for cereal crops in the CWR area is almost non-existent. As much as half of the rural population lives more than 30 kilometers from a major road, railraod, or navigable river. In some portions of the region, even those roads which exist lead to miniscule markets. For example, Upper Volta, a country the size of Colorado, has only two towns with more than 10,000 persons. In Niger there are six, and in Chad, eight. Clearly, then, transportation infrastructure is a major constraint to the development of a commercialization network. The economic radius within which farms which supply the urban demand presently lie depends upon the wealth or size of the final market: Bamako, Mali's largest market, has a market radius of about 200 kilometers for millet.

Beyond inadequate transport, another problem in supplying urban demand is that of the extra food produced, a large proportion would not actually be marketed. A certain quantity would be eaten farmers in the region have a high consumption elasticity for basic foodstuffs. Considerable amounts would be stored, given the unpredictability of the weather

in the Sahel. Finally, large stocks of seeds must be kept on hand because crop systems require frequent replanting, depending on the distribution of rainfall after planting. The marketable surplus, consequently, might be much less than the extra production. Cereal prices as a market incentive may, therefore, be weaker in this region than they are in other more favored areas, unless emergency food and seed stocks are guaranteed to be available in times of crisis. A grain program which addressed the problem of contingency storage and safe storage (since losses are high) might be able to increase the marketable surplus. Similarly, a food distribution program between surplus and deficit areas would both enhance the marketing system and assuage the fears of food shortages in certain areas.

Market constraints, therefore, have fundamental and far-reaching implications for the diffusion of new technology, particularly in the CWR area. Market constraints limit the size of the adapter, the rate of spread, the type of credit program adopted, the type of extension services which it is profitable to establish, and the types of technology to be offered. The size of the final market must strongly influence our expectations of what is technically feasible to attempt.

That farmers will adopt new technologies when these criteria are satisfied has been demonstrated, especially in the case of export crops. Despite the difficulties enumerated above, efforts must be made to increase food production: not only to reduce the massive import bills necessary to satiate the domestic demand for food, but also to redistribute income in favor of the small farmer. The number of small farmers which could benefit from increased food production is staggering. For example, a city the size of Ouagadougou with 500,000 inhabitants, growing at a rate of 8 percent per annum, requires at least 30,000 hectares of land to provide minimal cereal needs. The average size of a farm in that area is about six hectares. If half of this hectarage is used to meet subsistence needs, and the other half provides a marketable surplus, then 10,000 small farms are needed to supply the minimal needs of the city. Given an average family size of six, about 60,000 rural inhabitants would benefit from provisioning the city of Ouagadougou alone.

Indigenous marketing systems, if properly supported, could be made more efficient. There is also a role for grain marketing and stabilization service now coming into being in some CWR countries. In designing market components, there needs to be a shift from viewing traders as social termites to viewing trading as a productive and necessary high-risk activity which requires skill and special knowledge. Farmers and traders alike would benefit from a market information system that is kept current. In addition, organized market centers with modern facilities, including regulated scales and current posted prices, would be of great importance in improving market performance. As risks fall and opportunities widen, private investments would flow into the storage, arbitrage, and transport activities which government now feels compelled to undertake.

Better informed farmers and competitive traders could efficiently accomplish most of the tasks presently assigned to "project" authorities. Such ventures put great weight on a level of management beyond the competence of rural Africa, especially in areas where markets are thin. A disturbing trend in programs in Africa is the tendency to presume that local people, for whatever reason, can do nothing for themselves, and that lacking these abilities, an expensive management-intensive structure needs to be installed to perform services for the farm community. It would be cheaper to encourage local skills to fill this gap, to say nothing of the income redistributive aspects of this approach.

Given the diversity of the region, it is clear that no one technology or production promotion scheme or rural development program will be adequate to meet all needs. Rather, such a complicated environment, human and physical, will require a variety of programmatic responses. Although the absolute numbers of the populations of these countries are low, they are high relative to the resource base in dry areas--hence their thin distribution, poverty, and high rate of immigration. The flow of manpower to the coast reflects the underlying economic logic of the Coastal Zone. The inland states may not make economic sense alone. If viable economies are to be established which can in time provide their remaining populations with some minimum health, education and employment standards, these economies must become part of the larger West African economy centered on Nigeria and, to a lesser extent, on Ghana and the Ivory Coast. To talk of economic miracles in these inland states in isolation, and without Libyan levels of oil, is folly.

A number of food production program opportunities do exist in this group of states. The separate country statements will illustrate these opportunities in some detail.

B. Livestock Sector Overview

1. Introduction

Livestock in the CWR region perform a number of functions for producers, farmers, urban residents and governments:

a) For primary producers (pastoralists) stock raising is an efficient means of converting large areas of pasture into food and energy (milk and meat). Secondarily, it is a source of cash income through sales of live animals, carcass and meat, and by-products.

b) For some sedentary farmers, the livestock used as draft animals are an expansion of the productivity of their labor; they provide a source of manure essential in maintaining soil fertility and expanding crop output.

c) For all farmers, livestock represent a potentially profitable investment and a hedge against crop failure as on-farm feeding of young animals increases marketable value.

d) Among certain ethnic groups in the region, livestock have a socio-religious value and provide means of meeting an infinite variety of social obligations.

e) For urban dwellers, both in interior and coastal states, meat is a major source of protein. Thus, the delivered price of that meat is of constant concern. Probable future price increases in meat as demand increases will undoubtedly be a political issue in certain areas.

f) For governments in the CWR region, livestock represent an extremely important source of export and foreign exchange earnings. In addition, revenues from livestock are a key component of a very narrow tax base.

Any sound livestock strategy, program, or individual project must take into account the interrelationships that exist between the Sahelian, Sudanian, and Guinean zones, as well as the commercial interdependence between coastal and interior states. The potential and resources of each zone must be developed in a way that does no damage to the ecology of the area.

Within the livestock sector, certain broad constraints can be acknowledged and specific intervention points and resource requirements can be identified. The discussion that follows includes:

a) a summary of the characteristics of the livestock sector;

b) an assessment of development problems based on an analysis of these characteristics; and

c) those policy considerations and planning parameters most significant to AID in developing program guidance and in making resource allocations.

2. Characteristics of the Livestock Sector

Effective development of the livestock sector requires specific recognition of ecological limiting factors in certain zones. The following broad classification of zones is useful to reiterate.

Eco-Climatic Zones

In the Guinea zone, along the southern coast, rainfall averages 1,000-2,000 mm or more yearly and is well distributed; there is a short pronounced dry season. The climax vegetation here consists of trees and dense forest. Limited production of forage accounts for the very minor use of ruminant animals. Animal diseases and parasites which afflict ruminants in these regions are better tolerated by indigenous types of livestock than by temperate zone breeds; and livestock enterprises should be based on the improved management of animal types suited to the tropics. No great problem is encountered in producing forage for livestock, but research is needed to determine if livestock nourished on forage can be a profitable enterprise in the farming system. Crop farming has predominated over livestock in the Guinean zone from ancient times.

The Sudanian zone is a sub-humid region with yearly rainfall of 500-1,000 mm. Dryland crop production (sorghum, peanuts, cotton) is carried out during the rainy season. Mixed crop-livestock systems of farming are feasible wherever suitable arable soils occur. The climax vegetation is predominately of the Savannah type, including grass and woodland. Ruminant livestock are important throughout all permanent grasslands of the zone. Of considerable importance is the use of indigenous types of cattle, sheep, and goats which are adapted to the climate, which are somewhat tolerant of endemic diseases and parasites, and which are capable of utilizing native forages. The paramount problems encountered in livestock production are ensuring dependable supplies of stock water on rangelands and implementing grazing practices to insure the adequate supplies of dry standing forage (or harvested feeds) needed to carry stock through prolonged dry seasons when no plant growth occurs.

The Sahelian zone is a semiarid region with 250-500 mm of yearly rainfall covering an extensive area adjoining the Sahara. This zone suffers all the limitations of the subhumid zone, but intensified to a greater degree. The climax vegetation consists of a sparse cover of grasses and shrubs that are sources of feed for indigenous breeds of cattle, camels, sheep, and goats. The animal types must be tolerant of the stresses resulting from heat, limited stock water, forage of low quality for much of each year, as well as endemic diseases and parasites. The grazing of livestock provides the principal or only method of using those lands which are unsuited or marginal for crop production. Although the yield per hectare is relatively low, the total contribution of these areas to meeting food needs is quite substantial.

The semiarid areas immediately south the Sahara are the most critically abused rangeland areas of Africa, yet their potential for livestock production is substantial. The hard environment and seasonal vegetation impose a life of almost constant movement and annual period of semi-

starvation. As livestock move through the dry steppe and brush areas, herd shrinkage from disease and malnutrition is great.

The Saharan zone is an arid region, with less than 250 mm of yearly rainfall. Despite limited and uncertain rainfall, generally high temperatures, and very sparse vegetation, this area supports nomadic people who subsist on camels, hair sheep and goats, though it is a high risk occupation.

Livestock Production

There are three basic patterns of indigenous livestock production and management in West Africa which are largely determined by climatic and economic factors. A migratory (pastoralist) pattern predominates in the Saharan and Sahelian zones, but may also be found in higher rainfall grassland areas where crop production is marginal and human population is dispersed. Livestock-owning families depend upon their animals for a major share of subsistence income from the sale of milk and cattle for slaughter. Herders depend upon crop farmers for a major share of starchy staple food needs. Migratory patterns tend to be long and difficult, often exceeding 200 miles, and may cross international boundaries. Movements are generally in a north/south direction from rainy season grazing in the Sahel and desert areas to locations near permanent water sources in the dry season. A semi-migratory production pattern predominates in the Sudanian zone wherever rainfall levels and soils permit crop production. Herds graze fallow lands in the rainy season and when forage becomes limited, may be moved short distances to dry season grazing areas within 20-50 miles of the owner's village. Families grow most, if not all, of their food needs and cash crops, usually cotton or groundnuts, replace milk and complement cattle sales as sources of income. A sedentary production pattern is associated with the southern Sudanian and Guinea savanna zones where rainfall is higher. Some owners of oxen for plowing may also be included in this pattern. Because of the prevalence of riverine species of tsetse fly and trypanosomiasis, cattle are usually of the trypano-tolerant breed types. Parts of the Sudanian and Guinean zones are used during the dry season (particularly in drought years) by migratory producers.

The production, or beef surplus areas include Mauritania, Mali, Upper Volta, Niger, and Chad. The consumption, or deficit, area includes Ivory Coast, Ghana, Togo, Dahomey, and Nigeria. Cameroon, Guinea, Senegal, Nigeria and Zaire have substantial domestic production, as well as a significant level of imports. Since the cattle production areas are distinct and often remote from consuming centers, livestock programs must take into consideration certain regional requirements dealing with health standards, reciprocal taxes and transportation patterns. A recent FAC study (1974) estimates that in 1970 overall external demand for beef by the importing countries of West and Central Africa (excluding Guinea and Zaire due to lack of recent statistics) was about 200,000 tons. About 168,000 tons of this total were supplied from the Sahel, with the remainder coming from

south and east Africa. It is estimated that the effective demand will increase by 1980 to 430,000 tons. The Sahel can meet only a portion of this requirement. It is technically and economically possible that non-traditional areas of beef production can help to meet this increased demand without necessarily diminishing the income of the herders in arid and semi-arid areas. The Sahel, in any case, will remain the major cattle production area.

Some six million people out of a total population of 30 million in the six Sahelian countries depend almost exclusively on nomadic and semi-nomadic animal husbandry for their existence*. Calf mortality is high, 30 percent never reaching maturity. Animals mature late and are usually not sold until 6 years of age. The long trek to markets further adds to the cost of beef. An estimated 15 percent shrinkage in weight occurs. Direct costs of production and movement are compouned by a variety of tariffs charged in their movement; some 14 separate taxes have been counted in West African countries.

Mortality from disease remains an important factor limiting cattle production. While widespread mortality from rinderpest seldom occurs (due to large-scale immunization campaigns), trypanosomiasis, bovine pleuro-pneumonia, and protozoan diseases continue to cause a large number of deaths and debilitation within herds.

Traditional livestock-producing tribal groups have developed complicated systems for timing the movement of animals in order to provide feed and water with the least danger from disease, predators, parasites, and conflict with other tribal groups or government authorities. Nomadic and semi-nomadic herders represent an enormous skilled resource. Given the harsh environmental conditions, these herders have developed a means of exploiting arid and semiarid lands.

Thus it is traditional in the Sahelian zone, that cattle, sheep, and goats have been raised by nomadic herders who have lived primarily off the milk of their animals, and who have followed a seasonal pattern of movement dictated by the availability of rainfall and pasture. But as populations have increased, crop farming has been increasinly extended into the grazing zones and some herders have been partially sedentarized. Those who have not themselves grown food have historically traded milk for agricultural products. In either case, however, cattle

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*It has been estimated that livestock losses during the drought 1968-1973 could have been as high as 40 percent, although decreases as high as 90 percent were reported in specific locations. Hardest hit were sedentary and semi-sedentary herds in Niger, Chad (Kanem and Biltine) and east Mali. Senegal, except in parts of the Linguere and Fleuve areas, was relatively less damaged.

have been kept primarily for their milk, and not for their meat, which was consumed only when animals became useless or on ceremonial occasions.

Livestock Marketing

Although cattle have been historically traded in the area, the establishment of the French colonial administration introduced two fundamental changes. First, as the administration was established and as urban areas grew in size, the demand for meat by those not in rural areas increased. Second, the colonial government imposed a head tax, which had to be paid in cash and which generally necessitated the sale of a few head of cattle each year. As a result of these changes, a specialized commercial sector dealing in cattle began to develop.

After the Second World War, as the European powers pumped money into their African colonies, the size of the government administrations increased, and the rate of urbanization accelerated. Furthermore, some of the coastal territories, especially Ghana, Nigeria, and the Ivory Coast, developed extensive and rapidly growing export sectors, which served to stimulate their entire economies and to raise the standard of living of many of their inhabitants. Because the consumption of beef tended to increase relatively rapidly as incomes grew, the demand for meat expanded quickly, albeit from a relatively low base in the early 1950's. Today, cattle are the most important commodity in regional trade.

The present West African beef market structure derives from two major producing areas, the Mauritanian-Malian area and the Lake Chad area embracing Niger, Chad, and northern Nigeria. These systems link producing areas to beef deficit consuming areas along the Atlantic Coast. The western region supplies Senegal, Gambia, Ivory Coast, Ghana, and some products go to Nigeria. The central region supplies not only Nigeria, but also Central African markets, e.g., Zaire. Nigeria, because of its large population and increasing wealth, is the dominant market. It is estimated that 60 percent of all cattle are moved to a Nigerian destination.

Traditionally and today, the markets are supplied primarily by on-the-hoof animals. The market-destined herds have been bought, collected, herded, traded, sold, and butchered by a variety of buyers, dealers, and other middlemen. This is a completely indigenous marketing system developed over a long period of time with minimal participation, control or assistance from governments. Operating across international boundaries, it is a multi-million dollar industry that involves thousands of persons and hundreds of thousands of cattle. This system is enormously effective in delivering a continuous supply of cattle to the thousands of villages and towns throughout an area larger than the U.S. at a price the mass market can afford to pay. More than 50 percent of the sale price goes to the producer.

The system begins with the sale of individual animals to itinerant buyers in the "bush markets" who in turn sell to intermediate buyers. Actual ownership of an animal may change six to eight times before final sale to an urban butcher. The better quality cattle, i.e., older and larger, walk to the coast while weaker animals are slaughtered at intermediate points. Each major southern market has certain agents who, for a commission, act on behalf of northern dealers to receive, sell, pay drivers, and so forth, at the market. These agents frequently keep northern dealers informed about local market conditions and act in other ways (e.g., providing credit to butchers) to stabilize the marketing process.

The biggest problem of on-the-hoof movement of cattle is the value lost during the trek. Some estimates are as high as 15 to 25 percent. The principle charge against the system is that the high number of middlemen leads to an excessive mark-up. But cost studies indicate that the profit margin is not excessive in view of the long distances, weight loss, and other risk factors. Although the major means for moving meat to consuming areas is trekking, existing roads and rails are used to only a very limited extent because of high costs, uncertain availability of cars or trucks, and the excessive time required for delivery.

Perhaps only 15 percent of all cattle are trucked to market. Several institutional factors influence the limited use of trucks. For example, in the Ivory Coast, apart from long truck delays at the border (there are a total of six check points on either side), virtually every town has a transit charge on passing trucks. As a result, road transport costs are very expensive. Most animals are thus moved on foot, which is both time-consuming and costly in terms of weight loss and herd survival. However, trekking retains its importance since it is one way to avoid frontier formalities and because there is often no other alternative for animals which must be moved from remote places. Continuation of this practice will inevitably result in most animals arriving thin and sick because of the long overland trek, often without adequate forage facilities and other health requirements.

Governmental policy and other factors affect livestock marketing. A number of important consuming or transit countries, such as Upper Volta, have levied import duties and transit and other tariffs on consumers, reduced industry profits, and effectively prohibited the movement of dressed meat. Inland countries of origin, seeking to increase their share of the value added by international markets, are angered by such taxes and policies.

It is difficult to generalize about the price of beef cattle, the allocation of value among producers, marketers, tax collectors and sellers, but some figures are suggestive. For an animal of good quality moving from Mali to the Abidjan market, the producer seems to earn 57

percent of the final wholesale value, the marketers some 13 percent, and the remainder goes to taxes, interest, and other charges. A typical cattle trader appears to move three or four herds annually.

3. Development Problems and Strategy

The recent concentration of attention on the livestock sector by major donors is in recognition of the three essential functions performed by livestock: subsistence for a large number of pastoral and sedentary producers, surplus dairy and meat products for urban markets, and a valuable source of export earnings. Under normal conditions these diverse functions have been quite compatible. This fact should be kept in mind in assessing suggested development approaches, since no attempt to "modernize" the livestock sector has yet demonstrated that it can maintain this complementary balance.

Our broad objective in this sector is to improve rural income for those associated with livestock and animal husbandry. Given the overall food deficit in the region, U.S. assistance is based on the premise that most arable land will be used for food crop production in conjunction with cash export crops. It is therefore assumed that most livestock production will continue to be concentrated in areas in which the natural environment inhibits farming activities. AID proposals for major production-oriented investments are therefore mainly oriented toward the Sahel-Sudanian zones, with other areas considered in the context of mixed farming and/or regional marketing proposals.

The livestock sector, although its productivity is low, has performed reasonably well. During the past 20 years, the number of animals marketed annually in this region has increased from 7 percent to 13 percent. Favorable weather from 1954 to 1968, and veterinary interventions undertaken since the mid-1960's, have had the effect, however, of greatly overstocking the range land. During the 1967-74 drought period, this overstocking resulted in serious losses of livestock and government revenue, in addition to the suffering of the human population.

Many of the past interventions by donors and by national governments have contributed little to the constructive long-term development of the livestock sector. Some have actually been harmful. There is a serious lack of information and understanding of the working of the sector, making difficult the design of interventions which have a high probability of success. Because of the good performance of the sector over the last 20 years, interventions must now be designed carefully to avoid damaging the existing system, to avoid doing further harm to the ecology, and to avoid reducing the options available to the livestock producers themselves. Both the failure to intervene and misconceived interventions can be serious repercussions on the national economies and their people.

To prevent further degradation of the land resource and ultimately to take full advantage of the livestock potential, changes in range and water management will be required. Such changes will be difficult to implement since they are intimately associated with traditional ways of life and values. Obviously, the control systems devised must be acceptable to the cattle growers who will implement them. Present systems, while they may seem outmoded, have been developed over centuries of trial and error by the same expert tribal groups which have developed breeds of livestock capable of survival under harsh environmental conditions.

An effective development program must address a variety of interacting problems that currently impede significant progress. Unless the number of animals grazing and browsing in an area are regulated, any physical improvements will have only temporary and perhaps negative effects, since grazing animals will concentrate in and about them to create as much or greater damage as existed before. This caution holds particularly true for water development and animals health projects. While they are necessary ingredients for expanded livestock production, in the absence of controls over stocking rates, they will act merely to spread deserts more rapidly.

Within this context, there are three critical problem areas to which AID resources should be addressed:

a) The increase in the production of meat and dairy products in a manner that conserves resources, and wherever possible reclaims areas that have suffered environmental degradation;

b) the increase in the quantity of meat and dairy products delivered to the final domestic and export market at acceptable prices to both product and consumer; and

c) the increase in the numbers of Africans trained in various fields related to the livestock industry, especially range management, animal husbandry, statistics, and financial and socio-economic planning.

a) <u>To Increase Production and Conserve Resources</u>

From about 1941 to about 1965 there was an impressive expansion of pastoral herding in the Sahel. This expansion was due to a number of interdependent factors, which may be analyzed as follows:

(i) <u>Precipitation</u>: This appears to have been a period of exceptionally high rainfall. According to C. Toupet, the 100 mm isohyet of Mauritania, in the decade beginning 1941, shifted 650 kilometers northward,

with a consequential expansion of productive pasture at the expense of the desert. There was an associated northward movement of millet production across the Sahel, with the migration of the 350 mm ioshyet. This expansion of the millet-growing area in itself did not produce a squeeze on the herdsmen, because they themselves had increased pasture areas still farther to the north. This shift did mean, of course, that cattle had to be moved a greater distance from their rangelands to the southern coastal markets.

(ii) Animal Health. During the same period there were extensive, successful veterinary campaigns which substantially reduced animal mortality.

(iii) Ground Water Resources. Following independence in the Sahel, there were programs to increase available water resources by the drilling of deep wells, often equipped with mechanical pumps. As a result, a stocking rates rose quickly, often exceeding the carrying capacity of the pasture around the wells.

(iv) Commercialization. Although difficult to quantify, the development of markets for the purchase of livestock and livestock products probably motivated an increase in herd size, as well as an increase in annual off take from 7 percent to 13 percent. It is clear that the herdsmen responded with vigor to the demands of the market and provided a reasonable quantity of meat (beef, mutton, and goat) at a price which consumers could afford.

With the return to normal rainfall (1965-1967), followed by abnormally low rainfall (1968-1974), there was a reduction in the amount of available pasture as (a) the southward migration of the 100 mm isohyet restored desert conditions to the lands borrowed during the 1941-1965 period, and (b) the herds congregated in the southern reaches, particularly around the drilled wells, leading to over-grazing and destruction of pastureland. The environment would no longer permit the large numbers of animals which had been built up previously; and the reduced herds could not support the number of persons which they previously had maintained. The dramatic consequence was the death of animals and the movement of many herdsmen into refugee camps.

We now see clearly that past programs for improving livestock production in the Sahel overlooked the need for ensuring a balance between livestock numbers and pastoral resources. In short, these programs did not provide for effective grazing control, the basic key to a successful pastoral industry in arid and semi-arid zones. Grazing control is the first line of defense against the continuing degradation of the Sub-Saharan pasture lands and a first step in re-establishing livestock productivity. Although rehabilitation of degraded Sahelian pasture areas is also possible through soil and water conservation measures, the highest priority remains the achievement of basically satisfactory grazing control throughout the zone.

Traditionally, under conditions of communal, unrestricted land use, the pastoralist has three basic objectives which result in overgrazing:

(i) Milk Production. Milk is a major item in a pastoral family's daily diet. Usually milk sales are the only source of regular cash income. Consequently, the herder gives preferential treatment to all females in the herd, making the herd capable of rapid expansion under favorable weather and grazing conditions.

(ii) Savings. In the absence of banking facilities, the herd provides a means of accumulating wealth, encouraging the tendency to build up herd numbers as much as possible. In addition, large numbers appear to be an insurance against losses during a severe drought or outbreak of disease.

(iii) Maximum Individual Use of Commonly Owned Rangeland. Regardless of whether rangelands are overgrazed or not, under conditions of common land use, it is a perfectly rational reaction on the part of the individual livestock owner to increase his herd in an attempt to maximize his share of the commonly owned grazing resource.

A combination of regulatory measures and education are the most feasible means of addressing these range management problems. But, there is as yet little agreement among donor agencies and governments on the specific principles and modalities of instituting range management policies and practices.

Programs to develop better husbandry in, and more efficient use of, the semi-arid zones are admittedly difficult and long-range. But they are of the highest priority if the serious depletion of both animal and grazing resources is to be arrested. Nomadic or rotational grazing is one of the most efficient ways to utilize much of the semi-arid rangeland. Development programs need to capitalize on this system, while encouraging more efficient use of land and water resources through comprehensive mapping, water development, land use arrangements, and controls on the size and distribution of herds. Husbandry improvements will have to be promoted which respect to the traditional objectives of cattlemen, (milk, savings, prestige), but which offer herders incentives to adopt practices more suited to meeting the growing demand for beef. In combination with these programs, disease control can contribute to the growth of herds without further distortion of age and quality and without causing the deterioration of the land.

The fundamental causes of the deterioration of the area are still not clear. There is an interaction of man, land, and weather which is detroying productive land, reducing the productivity of those lands not destroyed, and increasing the precariousness of any hope for permanent

development. But the exact relationship between these factors is not clear and the degree to which different portions of this vast region are affected is also unknown. One of the first requirements, therefore, is a better knowledge of the region: its grasses, the number and composition of its herds, the productivity of its soil, and the movement of its people. Fortunately, there is a remote sensing and other advanced technology a means of gathering, processing, and analyzing relevant data more quickly and cheaply than would otherwise have been possible over such a vast region. Data gathered in such a way, together with that gathered selectively on the ground by conventional techniques, can provide the basis for designing effective conservation measures. Allied to this process must be the organization and motivation of groups who cultivate the area, so that the knowledge that is gained and the measures that are proposed become a part of the life of the people in the region.

Many of the past proposals for improved livestock production and marketing in the Sahel have envisioned an ecological stratification, with the Sahelian zone being used primarily as a breeding and calf production ("zone de naissance"). Such specialization would lessen the pressure on the Sahel's grazing lands, since, as part of the plan, finishing operations (growing and fattening) would take place in the Sudanian zone in conjunction with forage production or feed lot operations. The specialization approach has been challenged on the grounds that it would work against the economic benefit of nomadic producers, and, in any case, would be unworkable, since it would be at variance with traditional management practices. Nonetheless, A.I.D. should continue to study the economic and technical feasibility of this approach.

Short-term finishing, to restore weight loss during market treks has been demonstrated to be commercially and economically viable provided that a supply of low cost feed supplies can be assured. Attempts to experiment with "peasant finishing," using crop by-products and residues, are being tried as part of A.I.D.'s first Mali Livestock Development project.

The present nomadic system is based on multiple resource exploitation. Rather than concentrating on a single economic activity, the herder engages in a variety of activities. For this reason, we are already considering the economic and technical feasibility of assisting activities involving multiple resource exploitation, such as the production of small ruminants in association with or in addition to cattle.

Another potential means of relieving pressure on Sahel grazing lands is by making possible the greater utilization of land in the Sudanian and Guinean zones, which is presently infested with sleeping sickness and river blindness. Onchocerciasis (river blindness) is already under international attack. Analysis should be made now of the relative merits of trypano-tolerant taurin or crossbred cattle, and of zebu cattle in the

trypanosomiasis belt, to see what control, if any, of the tsetse fly is justified. Land use planning should be developed, with areas set aside for different uses and programs, to further our knowledge of its proper carrying capacities.

The Sudanian and Guinean zones would appear to offer means not only of alleviating pressure on Sahel rangelands, but of increasing food production, as well, through mixed farming activities. Made possible by introduction of work animals, the increase in the area under cultivation could allow dry season livestock finishing operations. Forage production could also contribute to the fertility of the soil. The current state of technology used on the farms will not allow such forage production activities, which now must compete with higher priority or higher return food and cash crops for scarce labor at peak periods.

Our major concern, is to work with the major livestock producing areas which (a) provide a means of livelihood for six million people, (b) offer an economic use for otherwise wasted land, and (c) require early attention if the resource base is not to continue its present deterioration. The Sahelian zone, with its natural limitations subject to variable climatic conditions, cannot alone support a livestock industry that must both provide subsistence security for pastoral peoples, as well as meat for the growing domestic and export markets throughout the area. The meat, milk, and income needs of the pastoral inhabitants of the Sahel must be fully reckoned with, within the limitations of that zone. The meat production capacity of the area depends fully upon the unique skill of these traditional stock raising groups to achieve the low cost exploitation of the marginal resources of the Sahel's remote areas.

b) <u>To Improve Livestock Marketing</u>

The goals of the marketing system should be (1) to deliver the "disposable" animals to the consumer with a minimum of loss in quantity (deaths, weight loss) and quality and at the least cost (when losses are considered); and (2) to provide a fair price to the producer and to the consumer. This requires competition at all levels of the marketing system.

The present marketing system is certainly functional. It markets millions of head of cattle (apart from other animals) each year, without bank credit and often without even clearing or exchange of different currencies through a bank. With little public investment or involvement, the present system works sufficiently well to place beef in the hands of most people, including the poorest. That the system can not provide more beef at a cheaper price is at least as much a problem of low technology, official regulations, and levels of animal supply as it is a fault of inadequate organization. At best, the system provides employment,

assembles, moves, and distributes animals over long distances, and does so cheaply. Moreover, it represents strong vested interests. Changes affecting this interest should expect to be met with vigorous resistance.

On the other hand, the current cattle marketing systems in the region have evident weaknesses which could be remedied:

--There is a lack of information on volume of sales, quality and prices in all cattle markets. Available data includes only estimates of the number of cattle presented for sale, with little or no reliable information on price. Low cost information systems could assist both producers and consumers.

--There is an excessive number of transfers in the marketing chain, resulting in increased costs to the consumer.

--During many months in the year, there is substantial loss in weight from trekking.

--There are difficulties with the loading, transportation, and feeding and watering of cattle en route to market.

--There are losses due to poor collection and handling of by-products, particularly skins and hides.

--There is widespread use by wholesale butchers of what appears to be expensive credit, thereby raising the price to the consumer.

There have been some attempts at improving the marketing system. These have been concerned with:

--physical facilities at markets, including water supply;

--veterinary services en route;

--feeding and water supplies on trek routes;

--loading facilities for trucks and trains;

--the recuperation of cattle before slaughter;

--improved abattoir facilities; and

--drying facilities for hides and skins.

The movement of cattle to markets on the hoof is still the major means of delivery within the CWR region, as well as the least costly method for range finished animals. Equipping stock routes with adequate water at points with an assured forage supply could reduce the loss in weight from trekking. The increased pressure on village water supplies during drought periods makes some villagers reluctant to provide water for cattle on trek. Water points are not difficult to install but it may be difficult to reserve the water supply for the trek cattle and to collect payment for the service.

On-going AID projects in the area are focusing on the reduction of losses in marketing channels between producers and consumers by improving trek routes (particularly water supply, but where it can be used, depots of food or grazing reserves); by improving transportation (e.g., withholding parks near railheads); and where it can be shown feasible, by establishing recuperation parks within a short journey of major slaughter houses. These interventions increase the quantity of meat delivered and help to even out the flow to the slaughter house and thus to prevent cyclic rises in meat prices to the consumer.

Efforts to improve beef processing have encountered problems. Many attempts have been made to locate slaughter facilities in the Sahelian zone so that the value added could accrue to producers and producing countries. Although not a uniform failure, most operate at far below capacity, and a number do not function at all. There are several reasons for this. First, importing (coastal) countries are not enthusiastic to witness the loss of business by their own slaughter facilities. Second, coastal butchers have been effective in some countries in causing tariffs to be levied which are high enough to render the importation of carcasses uneconomic. Third, the slaughter houses in the Sahelian zone produce a product whose quality is in some respects above much of the demand of the market. Sahelian slaughter-houses can play an important role in the development of meat exports to markets outside of Africa, but apparently not to markets in West Africa itself. Finally, the African preference and need for fresh meat gives good cause for animals to be killed as close to the final consumer as possible. It will be some time before cooling or freezing facilities are common and reliable enough to supply cheap meat to the main market in coastal countries.

These factors lead to the conclusion that modern processing facilities should be built primarily near those markets which demand high quality meat. An objection to this solution is that producing countries will want a larger early share of the income from the high quality meat going into the coastal urban markets. The resolution may be in intergovernmental agreements which assure the equitable distribution of proceeds to the producing countries, while providing for a sharing of the investment costs for production and finishing facilities in the producing countries.

A.I.D. assistance should be provided both nationally and regionally in order to facilitate the improved functioning of domestic and export markets.

c) To Increase Training in Livestock-Related Fields

The optimum long term development of this complex production and marketing system will requires changes in the individual approaches of innumberable herders, drovers, farmers and government personnel. Training is crucial to the effectiveness of livestock programs which by their nature require extensive delivery systems.

Some training is needed immediately, other training requirements must be met over the longer term.

(i) Education of the producers:

--Increase in functional literacy through rural non-formal education.

--Production of extension materials and programs for extension of husbandry practices.

--Training in supplementary activities, particularly for groups that are becoming sedentarized. This would be in the areas of crop farming, the use of draft animals, and forage production.

--Training in para-veterinary service to be undertaken by nomadic groups.

--Human nutrition and child care.

--Education of other professions directly involved in production and marketing in the sector.

(ii) Education of those indirectly involved would include programs for government and privately financed extension workers in modern techniques of production and range management.

(iii) Both training and institutional support in the following functional areas, depending on needs of the particular government: Animal production service, marketing service, research, planning, and administration.

4. Policy Considerations and Planning Parameters

Certain policy considerations and planning parameters which affect the livestock sector should be summarized for general program guidance.

a) Technical changes introduced into traditional production patterns will only be adopted if they are consistent with the value system of the society of producers, and if they appear to offer the probability of improving the welfare of the producers, in financial or other terms, with low perceived risk.

b) The changes proposed must not be damaging to the ecology on a long term basis.

c) The changes proposed and the projects which would implement them, must be high in the order of priorities held by the national governments.

d) The economies and governments of the producing countries will require from the livestock sector:

   (1) substantial tax revenue to support the national budget, and as partial recompense for the substantial public resources employed by the sectors. In the short run, this domestic tax contribution may be met by outside assistance but to do so may make it difficult to return to the previous situation; and

   (2) substantial contributions to foreign exchange earnings.

e) Experience indicates that it is not feasible to finance the operating and capital budgets of the animal production (veterinary) service through general taxation since only a small percentage of government revenues is available to finance the services. However, once herds are restored, the delivery of services should largely be paid for by the users.

f) Experience has shown that an increase in the number of Sahelian cattle leads to increasing pressure on hydro-pastoral resources, as well as a proportionate increase in commercialization and herd off take.

g) Range management must be appreached in a manner consistent with the unique realities of the area. There is a misunderstanding or an incomplete knowledge of the principles employed by the pastoralists in the management of their pastoral resources. There is some

evidence that the herders of the region have followed effective systems of pasture rotation and management, knowing that the long-term survival of their families and their herds in this difficult environment depends upon their skill at conserving and converting the resource. It appears that when the freedom to move was restricted or inhibited, these management systems ceased to function. Restricted movements and the confining of herds to smaller areas has had the effect of reducing the options open to the pastoralists and thereby of increasing their risk of loss.

h) Although there are pastoral codes governing stocking rates and grazing rights, these codes are presently not being followed. Modern codes, developed through traditional political structures among pastoralists, are needed. It is possible that new codes could be developed in part by using the results of the experimental interventions at Dilly (UNDP) in Mali and at Assale Serbowel (USAID) in Chad-Cameroon.

It is difficult to speculate on the regional role that will be played by organizations such as CEAO, ELC, OMVS, and LCBC. It is reasonable to expect that for some time, programs will be implemented on a national basis, although they would hopefully fall into the broad regional sectoral strategy outlined above. Perhaps the most important role for the regional organizations is to assure that the mutual benefits and essential need for cooperation among states is clearly articulated. Accordingly, the U.S. and other donors should look into possible investments in the coastal states wherever projects could assist in the modernization of the livestock industry, could promote greater regional integration, and could develop an awareness on the part of the coastal states of their common interest in the development of livestock with states of the Sahelian zone.

C. Education and Human Resources Sector Overview

A clear pattern emerges from the DAP education sector assessment formulated for each of the CWR countries.

First, the CWR formal school systems, patterned after the French, are all in need of reform and reinforcement. Every formal school system in the CWR area is unduly costly, annually absorbing on average 26 percent of the government recurrent budget. In addition, the school system in each CWR country is of low efficiency, measured in terms of high repeater and wastage rates. Furthermore, the outreach of the school systems, in terms of numbers enrolled, is erratic, favoring the national capitals and other special areas in each country at the expense of the rural hinterlands.

The outreach of the formal system is also limited, averaging only 27 percent of the corresponding age group enrolled in primary school. (This average ranges from Upper Volta at 10 percent to the Ivory Coast at 50 percent, excluding Cameroon, which enrolls 70 percent of primary-school age children.) Most serious, however, the curriculum content of the formal systems remains oriented toward the French-speaking urban civil service and away from the preparation of skilled manpower for rural development and production. Even as the numbers of illiterates increase in the CWR countries, the numbers also grow of unemployed school leavers, as well as of these holders of advanced diplomas and degrees who are seeking employment outside their own countries.

The inefficiencies of the formal school systems in the CWR area are thus twofold: internal, with high repeater and drop-out rates, involving considerable expenditures on youth who thereafter revert to illiteracy; and external, with graduates of the system at various levels leaving the rural areas (and frequently their home countries altogether), but often failing to find employment for which they were even minimally prepared. Access to the system has remained drastically unequal between males and females, urban and rural peoples.

Given the unusual extent of these inefficiencies, every government in the CWR area now recognizes the imperative to reform and reinforce its formal school system. A score of innovations are already underway in the region, some designed to "ruralize" schools and introduce more science and vocational disciplines, while others, outside the formal system, are aimed directly at illiterate youth, at unschooled adult producers, and at estranged school-leavers.

Despite this universal proclivity in the CWR area towards the reform and reinforcement of the formal school system, the DAP teams report that these measures, where taken, are nearly always unsatisfactory. The reforms of the formal systems too often have been promulgated by decree, without adequate preparation, and thus have tended to prove costly, disruptive, and disappointing. Similarly, too many of the non-formal reinforcements of the formal system have been launched on an ad hoc basis, without regard either to the actual requirements of those participating in the programs, or to the evaluation of the programs. Little regard is paid to the ultimate costs of non-formal programs, or to their possible interference with other comparable non-formal programs at work in the same areas. Thus many non-formal systems come to parallel and compete with each other, with the agricultural extension system, and with the formal education system themselves, rather than complementing them as intended. The added general failure, so marked in the area, to follow-up non-formal training with tools, credit, and remedial supervision has meant that much of the value of the non-formal programs has been lost to those who have participated in them.

The concluding general observation of the DAP education sector assessments, therefore, is that each potential CWR aid recipient country must begin to plan and act in terms of a comprehensive planned system of functional education. Each national functional education system will utilize in coordinated fashion every nationally available element of communication (schools, training centers, extension services, radio, and so forth) to meet recognized objectives of both the individual and the society (e.g., productive employment, health). It is within the context of each coherent national system that the enormously expensive work of human resource development may be most efficiently and effectively conducted. All AID funded human resources activities, therefore, whether they be executed at the regional or country level, must strengthen the concept of an integrated functional education system for each host country receiving AID support. These are the kinds of project activities that have been recommended in the programmatic conclusions in Section II.

D. Health Sector Overview

Health can be defined as the degree of adjustment of human populations to their geo-climatic, biological, cultural and emotional environments. No population on earth enjoys 100 percent adjustment. Within the framework of these four parameters, adjustment to the conditions of geography and climate in Central/West Africa assures a bare survival, easily challenged in terms of nutrition and shelter by recurring natural phenomena such as the recent drought. Adjustment to the biological environment is poor since there is no effective control of the most dangerous transmissible diseases. As for the cultural and emotional climate, the former provides no security and the latter is permeated by a fatalistic or apathetic attitude which for centuries has discouraged any sustained effort to create a better way of life. The role of parasitic infestation combined with protein malnutrition in creating such an attitude is strongly suspected.

The economic development implications of low levels of health among the population are many. First, the productivity of workers harboring a combination of parasites is seriously impaired. Second, various studies on the relationship between malnutrition and working efficiency show that productivity declines considerably when dietary intake is insufficient. Severe malnutrition in infancy may result in irreversible brain damage, lessening to a significant degree the ability to learn, and thereby limiting the development potential of the country's human resources. Thirdly, the presence of vectors and/or intermediate hosts of transmissible diseases often precludes the exploitation of large tracts of fertile land. To make these lands habitable for humans, stern and well supervised measures of preventive medicine must be applied to the population, the insect vector and/or the biological intermediate host.

The major health problems of the region are (not necessarily in order of importance): malaria, schistosomiasis, trypanosomiasis, onchocerciasis, guinea worm, measles, tuberculosis, cerebro-spinal meningitis,

gastrointestinal disorders (especially among children), and malnutrition. Widespread infectious diseases, malnutrition and unsanitary delivery practices on the part of traditional matrones (mid-wives) lead to high infant mortality rates which, in turn, lead to high fertility rates, maternal depletion, and deterioration of family health. Sanitary systems exist only in the form of programs and plans, most of which cannot be implemented for lack of personnel, infrastructure, education of the public, money and means of communication.

Extensive investments have been made in isolated episodic, unrelated activities mostly serving a prestige purpose with minimal return in health progress. It is now widely recognized that past projects have served at great cost some of the needs of the urban areas, leaving the rural areas practically without any coherent network of health resources. The consequences of these approaches are many:

1. They have created among some government personnel an elitist mentality that resists change.

2. They have contributed to the rural exodus by increasing the seductiveness of the cities and the repulsion of village life.

3. They have resulted in a quasi-total absence of experimental feasibility studies intended to serve as guidelines for the rural approach to health services now considered.

The nature of the problem, thus defined in terms of the target population and the health risks of the habitat, suggests both an extensive interstate, regional approach to a solution, as well as an intensive low-cost national approach. The two approaches, however, must be interrelated: they both address themselves directly to the problem of health services in the rural areas. In many cases, moreover, the extensive international approach will not succeed unless a national arm is available with adequate local financing to sustain it. The role of the national arm is to follow through with the population once the international causes of disease have been controlled.

The extensive, interstate approach aims at reducing and controlling the enormous health risks which manipulation of the environment always aims at giving the rural society the means to reserve the benefits of modern health science. In view of the paucity of natural resources presently available for production, the future welfare of the population of central-west Africa will surely depend in part upon efforts to make maximum use of the region's river systems and other water resources. But with these efforts, extreme care must be taken to ensure that the changes made do not create the ecological conditions for the breeding of more vectors and for the

multiplication of more intermediate hosts of lethal parasites.

On a regional basis, health services should include: (a) an interstate agency controlling the health consequences of international development activities; (b) a nutrition surveillance resource capable of responding to the many similar nutrition problems which occur in these countries; and (c) a mechanism for procuring essential drugs.

On a national basis, health services should include: (a) a capability of dealing with the national aspects of transmissible disease control; and (b) a health delivery system reaching into the rural areas. These elements are discussed in greater detail in Section II.

Foreign assistance can be useful in international programs for the control of certain diseases which the resources of any one country could not possibly bring about. A foremost example is the program recently undertaken to control the vector of onchocerciasis. This project has been thoroughly researched, its feasibility established, and the control program actually begun under the sponsorship of, and with financing by, a consortium of national and international agencies (FAO, IBRD, UNDP, AID, and WHO). The infested area overlaps several countries of the Sahel. When the program is completed, a few million acres of potentially excellent farming land will have been freed for human habitation. The risk will remain, however, that schistosomiasis, malaria, and trypanosomiasis will become problems as this area is occupied.

Generalized malaria eradication is probably not possible in the near future. The anopheline mosquito is widely distributed, and is both active in the drier regions and continuously present where water is more plentiful. The malaria parasite is extremely heavily and widely distributed in the human hosts as reservoir. It is possible that a universal prophylaxis, coupled with the effective screening of domiciles and the treatment of mosquito breeding sites, could eliminate the disease. But these measures are not now within the range of feasibility.

On the other hand, it would be highly practicable to suppress or even eliminate malaria from selected regions around population concentrations where it would be socially or economically desirable to do so. Spraying, the elimination of breeding sites, and the distribution of weekly proplylactic medication would work so long as these measures would be continued. These programs would require continuing monitoring, management and animation by responsible authorities. Such programs should have considerable appeal to international donor agencies.

Tsetse fly control can be also achieved, but again at the cost of considerable labor. Control by the sterile male technique is being investigated intensively at present, but the generation rate of the flies is slow (LeRoux n.d.). African trypanosomiasis, carried by this vector,

is an important disease among cattle, but the disease rate in man has been low in recent years.

Schistosomiasis is an exceedingly widespread disease in the region. Its economic impact is quite unknown. Control is very difficult; there have been few successful control programs anywhere. While the disease may have considerable impact on health in the Sahel-Sudan, one recent study has found that infestation with the parasite appears to have little influence on well-being or on economic productivity (Weisbrod, et al. 1973). The socio-economic role of schistosomiasis in Africa needs to be ascertained.

Many of the important diseases of the people of the Sahel-Sudan occur because of inadequacies in the water supply and from the lack of sewage disposal facilities. Enteric fever, infectious hepatitis and amoebiasis are the principal diseases in the group. The water-borne epidemic disease cholera has also appeared, which can always be expected whenever conditions of crowding and sewage-contaminated water coincide. Leprosy is at least in part related to poor personal hygiene, which in turn is related to a lack of soap and an adequate water supply.

Many of the most important diseases of the Central/West Africa Region are closely related to the state of nutrition. Among these are tuberculosis and measles. Case mortality rates for measles appear to be slightly elevated in the most recent year of the drought, especially in Upper Volta. There appears to be a rise in case attack rates as well; but from statistics available over the past 15 years, it appears that the case fatality rate, which is very high by the standards of developed countries, has changed little. The most probable interpretation of this fact is that there has been a state of chronic malnutrition among children in the area over this entire period of time, and this has been the cause of the high mortality from the disease.

Nutrition and infection cannot be viewed in isolation; they interact strongly. They also interact with water supply and sanitation. Thus, poor sanitation and impure water promote diarrheal disease and nutritional loss, and poor nutrition increases susceptibility to fecal pathogens. The system disintegrates as a vicious cycle. While is has been shown that the most effective point of impact for interrupting the cycle is at nutrition, proper sewage disposal and clean water can hasten the change in direction of the cycle for the better.

It may be concluded from the foregoing that most of the major medical problems of the region are related to social and environmental deficiencies which do not fall within the domain of the practitioner of medicine. Improved nutrition (which will be largely dependent upon improvements in agronomy and the economy) improved water supply, improved personal hygiene, provision of better sewage disposal, and national and international vector control programs are the types of change that will get at

the root causes of some of the major illnesses of the region. Nevertheless, relatively simple health measures, if extended through the Sahel-Sudan countries, could have a dramatic effect on the infant and childhood mortality rate, on life expectancy at birth, and on maternal mortality. Measles vaccination programs, improvements in infant and child feeding (especially at weaning and in the nutrition of the pregnant woman), tetanus vaccination, and education in elementary hygiene would all lead to a significant fall in the infant mortality rate, to the lengthening of life expectancy at birth, and thus perhaps, to an expansion of the dependency ratio. These results would occasion a further strain on available food resources. They would also lead to an increase in those services, such as schools, which are particularly geared to the young age groups.

With improved chances for infant survival, one might anticipate the possibility of a falling fertility rate (the "demographic transition"). But this effect has not yet occurred in some other African countries which have achieved dramatic declines in infant mortality. An extension of the present medical care system in the Sahel-Sudan region, with more emphasis on maternal-child health, would undoubtedly improve the probability of human survival and cause an increase in population which would be accompanied by an increased requirement for goods and services. Thus, a high fertility rate and a rising rate in population growth beyond the present existing high rates are likely to follow the introduction of related simple health and nutrition improvements, unless other changes occur: urbanization, female industrial employment, education, a vigorous and effective fertility control program, or some combination of these.

If one looks, by contrast, to the advanced Western countries for the causes of low morbidity and mortality rates and of lengthened life expectancy at any age, several important factors are apparent. The most important of these are improved nutrition, programs for the prevention of the major communicable diseases such as smallpox, improved environmental living conditions, availability of medical care, education in personal hygiene, and improvements in public water supply and sewage disposal. Not one of these factors can be identified as the "cause" of improvement; they are all interrelated and interdependent causes. Thus, provision of a good water supply is not likely to have a major impact if nutrition is not also improved. An improvement in general nutrition may have little effect if hygiene and sanitation do not improve. These factors, in turn, operate in an interdependent mode with other components of the economy, such as agronomy and general education. Therefore, we cannot expect to see dramatic and sustained changes in health unless there is at the same time a general coordinated improvement in many aspects of the socio-economic order. There are, of course, exceptions to this rule. The dramatic elimination of smallpox from the Sahel-Sudan through vaccination campaigns shows that it is sometimes possible to achieve dramatic results in the health field without antecedent economic development. But these exceptions only tend to prove the rule.

E. Transport Sector Overview

1. Introduction

Traditionally, the significant movements that have taken place in the CWR region have been mostly in the form of people, animals, export-oriented crops and minerals. Railroads were built specifically to transport export crops, such as groundnuts and cotton, minerals such as the phosphates in Senegal and the iron and copper in Mauritania.*

Road transport, on the other hand, has been limited in the past to light traffic of short hauls for agricultural production, fuel and consumer items. This trend began to change after independence and larger trucks began hauling commodities over longer distances. A number of problems resulted:

a) Because the road system was designed to carry lighter traffic (5-7 tons), the larger trucks (20-30 tons) are causing an accelerated deterioration in road conditions. The region's roads are in current need of strengthening and improvement.

b) Poor road conditions, lack of proper mechanical maintenance for trucks, and sparse fuel supply-points have caused transport costs to reach very high levels.

c) The predominately unidirectional movement of traffic between major population centers have caused freight rates to double due to the reduced load factor. Furthermore, agricultural products are harvested and cleared over a relatively short period, causing peak periods of almost complete slack during the rainy season. The trucker, who must amortize his capital investment over the whole year, therefore must charge a higher rate for the products he carries. He is also faced with the difficult decision of how much commodity he must load on his truck. On the one hand, he is tempted to overload his truck to make the maximum

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* An effect of this practice was that tariffs for the Senegal railroad were set according to the value differential between extraction costs for phosphates and the value at the port of Dakar. This may or may not have reflected the true operating costs of the railroad at the time. Changes in world market prices and the spiralling inflation, however, coupled with the lack of maintenance and proper management have caused the railroad to run at a deficit most of the time. Recently a 30 percent increase in freight rates was imposed on the Dakar-Bamako line, but is doubtful that this will cover railroad operating costs.

possible revenue on each trip. Poor road conditions can help bring about faster deterioration of the vehicle, and therefore increased maintenance costs and shorter lifetime. The average operating life of trucks in this environment is around 7000 hours. On the other hand, he can underload his vehicle to avoid excessive maintenance, but his return will be lower. Unaware of this rather delicate trade-off, most truckers opt for overloading, causing increased maintenance costs and a shorter operating life for their trucks, as well as the accelerated deterioration for the road surface.

2. Role of Transport in Drought Relief Distribution

The recent drought conditions have brought into a sharp focus the inadequacy of the transport network and of its associated storage facilities to handle the flow and distribution of the large shipments of foodstuffs, medical and other relief supplies that poured into the region at an unprecedented rate. Both the quantities of these supplies and the close timing of their arrival and distribution to remote areas have helped amplify the transport problem.

These problems have been caused by a number of factors, which combined to create the type of bottlenecks experienced during the drought period.

a) The road network in the region is rather extensive, but it suffers from the classical problems of lack of maintenance, upgrading, and proper drainage facilities. These problems not only contribute to the slowing down of traffic but also cause the complete isolation of certain areas as rain storms wash out the roads. The feeder road network ranks among the most neglected categories of transport infrastructure in the region. Thus, even when major administrative centers are accessible, the remote rural population is completely isolated. Neither food nor medical supplies can reach them by means of conventional vehicle transport.

b) The railroad links which provide access to areas not presently served by adequate roads (such as the eastern parts of Senegal and the land-locked countries of Mali and Niger) suffer from a multitude of problems. The least of these problems may be solved by proper management, better communication, dispatching and scheduling practices, and better loading

and unloading facilities. The more serious problems are those related to the poor condition of rail tracks and bridges and the antiquated conditions and shortages of the locomotive and cars. Because of these problems, the capacity of the railroad has been limited to 12,000-15,000 tons/month. During peak food shipments into the region, commodities waiting to be loaded on the railroad had to wait an average of six months on the Dakar docks.

c) Associated with the above problems is the lack of storage facilities in the ports, at transfer points, and in administrative centers. For lack of storage, substantial amounts of foodstuffs were damaged while waiting for transfers at various points along the way to remote population centers. The port of Dakar, for example, has a covered storage capacity of 25,000 tons. At one point, however, about 80,000 tons of supplies donated by various agencies and countries were stashed at the port awaiting shipment to Mali. No attempt was made to utilize such new technology as inflated plastic shells which can provide effective yet economical storage for food and other supplies in a very short time. Such experience calls for an overall study of storage needs and of technology which can readily meet such needs most economically.

d) The number of trucks which could be mobilized to meet the high flow of commodities during the drought was rather limited. Personal savings are limited, and despite the fact that private trucking operations in the reginn are highly profitable, they are also quite risky. The lack of adequate national credit institutions caused small truckers to rely upon the costly and rather restrictive financing terms of businessmen in the major cities.

e) An additional and equally important set of problems also helped aggravate transport problems in the region. This category included delays owing to bureaucratic red tape and to cumbersome international transit policies.

3. The Search for Solutions

Drought relief distribution operations imposed loads on the transport system of the region beyond its capacity, both in patterns and magnitude. The CWR transport system is one designed to allow the traditional flows of goods and people in certain directions at certain times of the year. The urgent need to provide remote areas with food and medical supplies during the drought led to the airlifts and other expediencies whose costs have been very great.*

Implications of the transport problems encountered during the drought are far reaching. They pose serious questions about the capability of conventional transport technology to be responsive to unusual operating conditions and adaptive to environmental and climatic variations. And if conventional transport technologies are either physically or economically limited in providing such functions, a search for other feasible technologies must be mounted. Presently, air-cushioned vehicles and lighter-than-air facilities are at least technologically among the leading candidates in this category. A great deal is known about the supply aspects of these facilities (capabilities, costs, etc.), but the demand side is not yet well established (the patterns and potentials for usage). As pressures continue to build for effective transport, the search for new technologies or alternative uses of existing technologies receive greater impetus. In the short run, however, traditional surface transport, including animal transport, along with air transport will continue to be the most viable means for movement of goods and animals in the Region over the next 10-15 years. Emphasis must be placed, therefore, on the upkeep and strengthening of the present transport system. Attempts must be made to utilize its full capacity through a combination of policies and tariff structures. Better storage and transfer facilities are needed to minimize costs and increase flows. Recommended interventions will be addressed separately in Section II, under Regional Programmatic Conclusions for Transport.

4. The Role of Transport in Development

Transport projects belong to a group of public sectors known as social overhead projects. These projects provide the infrastructure

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*An example was celebrated truck caravan across the Sahara desert in 1974. The Food for Peace program contracted the Algerian National Trucking Company (STNR) to carry food supplies from Ouahran on the Mediterranean to Gao in the sixth region of Mali as one phase of the operation. The 2,700 kilometer trip was made by caravan of 20-ton semi-trailers at a cost of $240 per ton. This amounted to $.90 per ton-km, among the highest rates registered in freight operations. However, given the fact that the trip back was made virtually empty, the actual cost was $0.45 per ton-km.

which serves as a means to sustain and further stimulate development efforts. This is to be distinguished from projects which themselves serve as productive agents. Therefore, the impacts of the transport sector on other sectors in terms of pure economic returns are difficult to measure. The contribution of the transport sector to the gross domestic product (GDP) varies from one country to another. However, in the Sahel countries, where productivity is typically low and the transport system is inefficient (i.e., of high cost), transport's contribution to the market GDP is probably very significant. In most West African countries, the proportion of the transport sector to the total Market GDP is over 10 percent.

Furthermore, where inter-industry links are lacking, transport costs become a significant factor in determining locational patterns for development. Thus, reductions in these costs are likely to have a positive impact on development by bringing into the production process a combination of land, labor, and resources and by providing access to markets. It is therefore not surprising that development schemes and communities have almost always polarized and grown up along transport taxes.

Transport systems also have a major direct impact on social developments. Education and expectations of people are certainly influenced by the communication role of transport systems. Social traditions and political structures are also directly influenced by the changes of the transport network. Public health is affected as better transport eases the provision of health care, the extension of education, and the reduced possibilities of spread of diseases. Transportation also influences the rate of urbanization and the pattern of formation and growth of urban centers. In some cases it is believed that improved transport capacity has encouraged increased immigration to urban areas; in other cases, there is evidence to the contrary.

Since improved transportation frequently requires the investment of scarce resources, the timing, direction, and distribution of investments in the transport sector have significant short and long range implications for the economy. Most of the financial commitments to transportation are large and generally irreversible tying up comparatively large amounts of resources for extended periods of time. For example, capital investments in the West African transport sector constitutes one-fourth to one-third of national development budgets and of foreign aid to the area. Although economists agree that the transport sector represents a key factor at the early stages of development, investments must be carefully evaluated and long range plans must be drawn up to provide effective system management to reduce overall capital investments. This is particularly necessary in the CWR region where the marginal opportunity cost of the capital is high, and where considerable savings can be achieved at this stage of development in the economies of scale and proper utilization of technologies.

Once realized, transport investments tend to serve as a locational focus for social development and as a stimulus to investments in other sectors. Although conceptually transportation is a derived demand, it tends to influence considerably both the supply and the demand of all factors of production in agriculture and industry, and therefore plays more than a passive role in economic activity.

5. The Limiting Effects of Transport in the Region

The role of transport in development is one which has been the subject of intensive and prolonged debate. Discussion along these lines generally reduce down to an examination of the chicken-and-egg problem. The answer that seems to be emerging is that transport cannot be considered apart from its role as one, and only one, constraint in overall production system. Where transport is the constraining element, no amount of land, labor, or capital can bring about substantial changes in production. On the other hand, where those other elements are missing, no amount of transport can bring about the desired results.

It may be of interest then to examine the limiting effects of transport in light of its role in the development of the region.

Perhaps the most striking aspect of transport in the region is its high cost. Generally, transport costs are high when:

a) the infrastructure is non-existent or in poor condition;

b) the production system is limited to a certain part of the season and as a result traffic flows are limited;

c) both the production and consumption patterns are limited so as to produce a one-directional flow of goods and products;

d) both the production and consumption levels are limited so as to discourage the achievement of economies of scale through the use of larger and more efficient transport means.

For long distance movements, economies of scale are reasonably easily attained. Presently, 20-ton and 30-ton trucks are commonly used in the Region. Examples of this can be found in the Abidjan-Bamako road, and the Dakar-St. Louis-Nouakchott segments, as well as for internal traffic within these countries. It is more difficult, however, to use large trucks in the collection or distribution of farm products. Typically such operations involve several hierarchies of consolidation or deconsolidation. For example, millet or sorghum is harvested, then typically

carried on the backs of animals into graineries owned by the local farmers. It is carried from there to a number of collection points on animal carts or even by tractors. Transport is from there consolidated into a trucking operation which can in turn be broken down into more than one stage, the last of which involves line haul operations. Export-oriented crops may further be consolidated into containership or other forms of surface, air, or ocean transport. The reverse takes place when agricultural inputs, food supplies, or consumer items are distributed to rural or urban areas. To see how costs are broken down, consider the following case of consolidation in the transport of millet in Mali in 1974.

Stage	Average Distance	Means of Transport	Type of Road Surface	Cost of* Transport (MF/ton-km)
1	10-15 kms	Animal Cart (½-1 ton)	tracks	100-150
2	50-60 kms	5-7 ton truck	Improved dirt roads	45-70
3	more than 100 kms	20-30 ton trucks	Laterite or Asphalt	35-50

*One US Dollar = 460 Malian Francs (MF) = 230 FCFA
Based on gasoline cost of 140 MF/liter, and diesel cost of 110 MF/liter.

These costs will vary depending on the conditions of the road, the time of the year, the type of trucks used, the areas in which the trip is made, the type of products transported, and so forth. However, the ranges are rather representative of the cost figures encountered in the Region. Trucking costs are anticipated to go up in 1975 by about 30 to 50 percent.

These above costs do not include transfer costs, which are negligible in the first two stages, but which could become substantial in the third stage. Transport costs in the first two stages can be about 10 percent of the value of the product at the farm, while the third stage can add about 10 to 15 percent of this value for each 100 kms of transport. This calls attention to the importance of feeder and secondary roads, which play a vital role in this process.

As has been suggested, the economics of scale achieveable in transport are also related to directional and seasonal characteristics of movements. Transport costs, therefore, cannot be reduced unless both production and consumption are balanced to avoid empty backhauls and seriously reduced load factors. This is typically the case now in the region where the disequilibrium between urban and rural activities cause unidirectional

flows and increased transport costs. Furthermore, the seasonal character of agricultural production and labor movements results in the peaking of transport activities. Perishable commodities will be partially damaged due to the inadequate capacity of transport. Other non-perishable products will also tie up the transport system for a certain period of time, thereby frustrating the flow of other goods. Furthermore, this peaking with severely limited activities in the off-season result in higher transport costs as the capital cost of the trucks or other facilities are amortized over the whole year.

F. Housing Sector Overview (three countries)

The housing problems in Ivory Coast, Cameroon, and Gabon, the three CWR countries in which AID intends to undertake housing programs, are quite similar. Urban areas are growing at the rate of 7 to 10 percent per year, while national populations increase at 1.5 to 2.5 percent. Urban populations, which were 20 to 28 percent of national populations in 1970 will be 30 to 40 percent of the national population in 1980. During this time, urban populations in Ivory Coast and Cameroon will double or more than double, while that of Gabon will increase by 75 percent.

The housing programs of these three countries have fallen far short of providing adequate housing for all the migrants to the urban areas. Officially sponsored housing programs amount to perhaps 5 percent of the annual demand. Most of the remaining increase in the housing stock is in the form of squatter shacks. There are few, if any, families sleeping on the streets in these countries. The typical house, however, is about 30 square meters, made of wood plank or mud without water and sanitary facilities.

Housing is receiving increased attention in all three countries. In the Ivory Coast, a National Housing Bank is being developed which will have overall fiduciary responsibility for housing programs. Cameroon is formulating a National Housing Policy which will be entrusted to a new Ministry of Equipment, Housing and Lands. In Gabon, a National Housing Office has been established to promote and develop social and low-income housing. At the same time, increased attention is being focused on the question of housing for low-income families. In Cameroon, this has taken the form of a sites-and-services program for Yaounde and Douala, which is anticipated to cost $20 million.

Two housing quaranty programs totalling $12 million have been authorized in the Ivory Coast. The first was completed several years ago, and the second is still being implemented. In Cameroon and Gabon, approval in principle has been given to new housing guaranty programs, but neither has been authorized.

Similar constraints to increased activity in the housing sector are shared by all three countries:

1. Capital - Much of the capital requirement for housing has come from foreign borrowings and have been either limited in amount or tied to foreign procurement or foreign construction firms. Terms have been usually ten to twelve years.

2. Structure - The countries have typically suffered from the absence of national housing policy, from inadequate land tenure and transfer regulations, from inadequate city plans, and from a lack of coordination between the governments and their parastatal housing organizations.

3. Skilled Manpower - There is a chronic shortage of trained and qualified managers and technicians.

4. Construction Costs - While high in all countries, construction costs in Cameroon are 60 percent above the Abidjan level.

Proposed AID housing programs in the three countries are consistent with the shelter sector policy adopted October 24, 1974. The CWR housing program will place emphasis upon the development of national housing policies and housing programs which will address the housing needs of families below the median income level. Technical assistance will be offered to help increase the management and technical capacity of housing institutions. A grant-funded technical assistance program is now being developed to improve the capability of Cameroon and Gabon to undertake sites-and-services programs.

G. Population

I. Possible Demographic Trends and Consequences in Sahelian Africa

In order to preserve data consistency, the population parameters utilized herein as prepared by the U.S. Bureau of the Census, are taken from the United Nations' World Population Projections As Assessed in 1968. Base year data estimates are as of 1972 and projections are reported for five-year intervals through the year 2002. Three population growth projection series are presented: rapid, medium, and slow; the medium variant is assumed to be the most likely. The objective (manipulated) variables are life expectancy at birth and gross reproduction rate. This discussion is divided into four brief sections: (1) overall population trends; (2) labor force, (3) food consumers and (4) primary and secondary education. Each section presents the projection and result and compares differential consequences of rapid versus slow growth. Simply put, given the assumptions used, in the terminal year (2002) the crude birth rate (CBR) under the rapid growth variant will be greater than the slow growth and the rapid growth crude death rate (CDR) will be lower.

1. Overall Population Trends

Base year (1972) data for the 14 Sahelian countries indicate a total population of about 46,891,000 of which 23,675,000 are females (50.48 per cent) and 23,216,000 are males (49.52 per cent). As shown in Table 1 (medium growth variant), over the 40-year projection period the Sahelian population should more than double. The effect of falling mortality should lead to an average increased life expectance of 14 years for both males and females. Assuming fairly constant fertility levels until about 1990, the age composition of the population will produce increasing rates of population growth until the late 1990's and the average age of the population will probably not rise until the next century. The following data report the patterns of average age and population growth rates:

Year	Average Age	Per Cent Popn. Growth
1972	23.79	--
1977	23.29	2.29
1982	22.83	2.53
1987	22.38	2.78
1992	22.09	2.91
1997	22.18	2.77
2002	22.54	2.66

Sections 2 through 4 trace out the effects of this continued population growth.

The differential effects of rapid versus slow growth assumptions are shown in Table 2. In terms of total population, the year 2002 rapid growth variant population will be almost 20 per cent higher than the slow growth variant. In fact, the Sahelian population will exceed 90 million five years earlier under rapid growth. Although the more rapid decline in mortality will exhibit a gain of eight years to life expectancy under the rapid growth variant, the relatively slower fall in fertility under the rapid growth variant will result in a younger population, on the average, and higher growth rates. Specifically,

in 2002 the average age under the rapid growth variant will be 21.7 years and the population growth rate will be 3.25 per cent. The slow growth figures are 23.4 and 2.14, respectively.

2. Labor Force

One of the most fundamental interrelationships between fertility and economic development is the labor force. As seen in Table 3, rapid population growth will generate a greater absolute size of the labor force than under either the medium or slow growth variants. On the other hand, the changing age structures of slower population growth should result in a lessening of the dependency burden the labor force must carry. For example, under the high growth variant each member of the economically active population must support a child aged 0-14. This burden is about 20 per cent less under the slow growth version. Although not reported here, it can be demonstrated that declining fertility will enhance labor productivity and at least partially alleviate unemployment, both of which enhance further economic growth.

3. Food Consumers

Given the concern over the adequacy of agricultural production in the Sahel region, an attempt was made to project the impact of fertility upon food demand and create an index which indicates the relative burden on the labor force. Table 4 reports the results of this investigation. Given realistic assumptions about the age composition and age cohort food consumption, the future Sahelian population figure was adjusted to reflect the total number of food consumers. The total number of food consumers can exceed the total population due to higher food consumption needs of a young population--a factor most often neglected in agricultural planning.

The differential effects of rapid versus slow growth are twofold: (1) rapid growth generates a much higher level of absolute food consumers and (2) the relative burden of food consumers upon the total labor force is greater under rapid population growth than slow growth.

4. Education

Education represents one of society's most basic investments in mankind and thus largely defines the quality of the future labor force potential. Table 5 presents a primary and secondary school age projection for the Sahel. As would be expected, rapid population growth yields much higher levels of school age populations, albeit that the proportion of total population remains relatively stable in all variants. Clearly, more rapid population growth lessens the probability of attaining national targets of universal education. Of course, with more comprehensive data one would be able to quantify the greater financial burden of education caused by rapid population increase.

Selected Population Data

Country	Estimated 1973 Population (Millions)	Birth Rate	Death Rate	Growth Rate	1985 Population (Millions)
Cameroon	6.2	43	23	2.0	8.4
CAR	1.6	46	25	2.1	2.2
Chad	4.0	48	25	2.3	5.5
Dahomey	2.9	51	26	2.6	4.1
Gambia	0.4	42	23	1.9	0.5
Gabon	0.5	33	25	0.8	0.6
Guinea	4.2	47	25	2.3	5.7
Ivory Coast	4.6	46	23	2.4	6.4
Mali	5.5	50	27	2.3	7.6
Mauritania	1.3	44	23	2.1	1.7
Niger	4.2	52	23	2.9	6.2
Senegal	4.2	46	22	2.4	5.8
Togo	2.0	51	26	2.5	2.8
Upper Volta	5.7	49	29	2.0	7.7
Subtotal	47.3	46	26	2.2	65.2
Africa Total	374.0	46	21	2.5	530.0

Table 1

Selected Demographic Projections
for Sahelian Africa - Medium Growth Variant

Year	Total Popn. (000)	Crude Birth Rate	Crude Death Rate	Life Expectancy Male	Life Expectancy Female	Gross Reproduction Rate
1977	52507	.0463	.0237	39.66	42.45	3.153
1982	59483	.0464	.0215	41.99	44.89	3.153
1987	68238	.0468	.0194	44.50	47.50	3.153
1992	78759	.0457	.0170	47.19	50.30	3.053
1997	90279	.0416	.0144	50.10	53.32	2.752
2002	102919	.0381	.0120	53.23	56.58	2.461

Table 2

Selected Demographic Projections
for Sahelian Africa

	Rapid Growth				Slow Growth			
Year	Total Popn. (000)	Crude Birth Rate	Male Life Expectancy	Popn. Growth Rate	Total Popn. (000)	Crude Birth Rate	Male Life Expectancy	Popn. Growth Rate
1972	52681	.0469	39.84	2.356	52603	.0471	39.31	2.326
1982	59925	.0468	42.59	2.610	59519	.0473	40.88	2.501
1987	69006	.0467	45.57	2.862	67478	.0458	42.53	2.542
1992	80578	.0470	48.83	3.149	75983	.0424	44.27	2.403
1997	94553	.0452	52.39	3.251	84921	.0389	46.09	2.249
2002	110962	.0425	36.28	3.252	94416	.0362	48.01	2.142

Table 3

Labor Force and Youth Dependency Ratios [1/]
for Sahelian Africa

Year	Rapid Growth		Slow Growth	
	Labor Force	Dependency Ratio	Labor Force	Dependency Ratio
1972	23707	.828	23676	.827
1982	26365	.855	26230	.851
1987	29695	.874	29358	.852
1992	33838	.900	33150	.825
1997	38982	.912	37623	.769
2002	45390	.903	42616	.706

[1/] Ratio of Economically Active Population (Ages 15-64) to Population Ages 0-14.

Table 4

Food Consumers and Ratio to
Labor Force for Sahelian Africa

Year	Rapid Growth		Slow Growth	
	Number	Ratio to Labor Force	Number	Ratio to Labor Force
1977	52659	2.221	52587	2.221
1982	59911	2.272	59541	2.270
1987	68962	2.322	67701	2.306
1992	80381	2.376	76748	2.315
1997	94418	2.422	86457	2.298
2002	111243	2.451	96680	2.269

Table 5

School Age Population and Ratio
to Total Population for Sahelian Africa

		Rapid Growth		Medium Growth		Slow Growth	
	Year	Number	Ratio to Total Popn.	Number	Ratio to Total Popn.	Number	Ratio to Total Popn.
Primary	1972	8503	0.161	8505	0.162	8489	0.161
	1982	9804	0.164	9668	0.163	9738	0.164
	1987	11437	0.166	11167	0.164	11238	0.167
	1992	13547	0.168	13258	0.168	12780	0.168
	1997	16384	0.173	15571	0.172	13862	0.163
	2002	19435	0.175	17220	0.167	14633	0.155
Secondary	1977	3631	0.069	3629	0.069	3630	0.069
	1982	4247	0.071	4253	0.071	4232	0.071
	1987	4888	0.071	4801	0.070	4836	0.072
	1992	5738	0.071	5585	0.071	5614	0.074
	1997	6795	0.072	6660	0.074	6385	0.075
	2002	8297	0.075	7857	0.076	6802	0.073

II. National Demographic Policies

The range of a country's options in regard to a national demographic policy can be considered as a continuum residing between the two extremes of defined growth objectives (i.e., actual population size at some specific time in the future or an optimal rate of population growth) either pro-natalist or anti-natalist. The commitment to this objective is indicated by various factors (i.e., level and extent of policy, financial allocations to this objective, and the universality and communality of its administration). Within this description, the countries of the Sahel-Sudano region of Francophone West Africa can be best classified as neutral or noncommitted. Within this neutrality exists a variance ranging from the pro-natalist statements of the governments of Cameroon, Central African Republic, and Mauritania to the recognition given to the deleterious effects of rapid population growth on certain sectoral objectives in Upper Volta, Togo, and Dahomey (Table 6). These differences are for the most part negated by the lack of persistent and pervasive, across-the-board application by these governments. Fundamentally, this present state of uncertitude and inconsistency derives from three basic deficiencies in the overall process of long-range planning--a lack of reliable baseline data, the absence of a centralized coordination for national development policy, and insufficient technical and financial resources to implement these policies on a national scale.

Measured against the various attitudes taken during the World Population Conference at Bucharest in August 1974, the countries of this region are most consistently aligned with those which have confined their concern for rapid population growth within the context of the total development perspective for their countries. One of the better examples of this attitude is revealed in the 1972-76 Five Year Plan for Upper Volta which directs the government to regard the potential need for a national policy for a reduced rate of population growth based first on accurate demographic data and considered only within the "harmonious balance" between human and material resources for an improved standard of living. Perceptions of the impact of population growth are for the most part clouded by comparisons by the governments of the relatively sparsely inhabited Sahel countries to the densely populated developed countries of Europe, with the resultant conclusion that economic development requires or at least is not inhibited by abundant human resources, primarily in terms of manpower. Within the region, the rapid economic growth of the Ivory Coast and the government's encouragement of immigration reinforces this attitude. In those cases which do exist where governments have identified situations where population growth has outstripped the government's ability to provide adequate services (e.g., health, education, or employment) the common response is to seek the means to meet present demand rather than to consider the possibility of decreasing future demand. For a good portion of this difference between the demand for services and what the government is capable of supplying, the governments turn to the various foreign donors, thus not only diverting development funds to the mere maintenance of already inadequate situations, but momentarily relieving the governments of the responsibility of facing the inevitable evolution of even greater problems sometime in the future. Existing systems of national planning where the upward flow of sectoral needs is compiled but not coordinated at a central level

Table 6

SAHEL COUNTRY DATA ON POPULATION/FAMILY PLANNING

Population Policy	Cameroon	CAR	Chad	Dahomey	Gambia	Gabon	Guinea	Ivory Coast	Mali	Mauritania	Niger	Senegal	Togo	Upper Volta
Policy to limit population growth but no numerical goal					X									
Policy favoring family planning for health reasons with no goal specified									X			X		
Stated government neutrality, no goal indicated				X				X			X		X	X
No statement of policy available no goal indicated									X					
Oppose family planning, no goal indicated			X			X	X							
Favor rapid population growth, no goal indicated		X								X				
Favor rapid population growth, specific numerical goal indicated	X													

preclude a full appreciation of the impact that measures to alter demographic trends in one sector will have on the others, such as the influence that measures to reduce infant mortality will have on the demands on education in 5 years and on employment in 15, etc.

Lacking not only the mechanisms for centralized planning but also the technical capability, most of the governments of the Sahel rely on autonomous indigenous or foreign institutions for applied demographic research. Statistical agencies of the governments are basically concerned with compilation and not analysis. This is reflected in the demographic inputs that do exist in national planning documents which are limited to a description of age/sex distribution. Universities are not considered a source of influence on government policy; demography, where it is taught, is strictly theoretical. Research conducted by non-governmental organizations and especially that funded through foreign assistance, is highly susceptible to rejection by the governments. Even government-conducted research and analysis is vulnerable to political suppression, such as the declaration by Dahomian officials that all data published under the former administration was unacceptable and inapplicable. However, it would appear that research conducted within the authorization of a particular sector of the government stands a better chance of having influence on policy than that conducted by outside sources--universities, institutes, or individuals. The paradox, of course, is that the technical resources and interest to carry out this type of research are generally weakest within the governments.

III. Baseline Data Sources

During the late 50's and early 60's, the government of France, through the Institut National des Statistiques et des Etudes Economiques (INSEE) sponsored the first national level "census" surveys in the region. These surveys continue to serve as the base for the population estimates and projections quoted by most government planning agencies. It is generally recognized that technical problems (insufficient and undertrained interviewers), conflicting objectives (surveys were used in a number of cases to establish tax rolls) and the quality of responses (false reporting of age, number of wives, children and deceased children) contributed to the inaccuracy of already inadequate studies. Demographic sample surveys based on these studies have for the most part established the rates which are still used for demographic projections. Combined with administrative census reporting systems instituted by the French colonial administration early in the century, the surveys of the last decade do provide an historical perspective of population growth. The INSEE studies were intended as only the beginning of a series of demographic studies to be carried out by the respective countries; however, apart from a few localized and sectorally oriented studies, little has been added to this base. Improved methodologies for estimating population size and growth such as Brass, Princeton, the U.N. and most recently the Bureau of the Census LRPM have been applied to African data but have not been incorporated into the official perspective. The African Census Program funded through UNFPA is providing the impetus for the second wave of national-level demographic studies in the region in various stages of development; only Togo has completed its enumeration. The surveys are fraught with many of the same

problems as the INSEE study (e.g., lack of trained enumerators, political manipulation of survey questions, conflicting objectives of data use, an insufficient and inadequate administrative network) leading to delays in targeted completion dates and adding substantially to costs. In addition, governments are expanding on the concept of the original plan for national surveys to nationwide headcounts based on a rationale that the earlier surveys proved inadequate, and finding other project-related needs that have their greater utility beyond the objectives of the census. Discussions with UNFPA officials and census technical advisors in the field raise serious doubts as to the priority these governments place on the actual collection of baseline data versus the opportunity the program provides for them to respond to a number of nondemographic needs.

Estimated Initiation Date of Country Enumeration, African Census Program

1974 and prior: Gambia, Togo

1975: Cameroon, CAR, Ivory Coast, Senegal, Upper Volta

1976: Chad, Dahomey, Niger, Mali, Mauritania

The practice of designating officials at local levels to periodically report vital events and population change has generally been abandoned. The adequacy and accuracy of the "administrative census" reporting system varied from country to country as well as within the countries themselves, but in general was considered to be inferior for demographic purposes. In the absence of vital registration systems, these served as the only permanent reporting source and it has been suggested that such a system would be useful if improvements were made. However, government interest in maintaining the administrative censuses appears to be based more on the fiscal implications (i.e., the establishment of tax roles, disbursement of social benefits), resulting in errors caused by the manipulation by local officials and the avoidance of registration by adult males. The system was best applied in rural areas where population movement was limited by traditional land ties and least effective in urban areas. The current movement away from these traditions would therefore indicate that this method of estimating population will probably not improve even with increased technical inputs. Vital registration systems that do exist, even where birth registration is required for access to government-provided services (e.g., education), are greatly underutilized. Based in government health facilities, this registration system is more a reflection of the extent of utilization of health services. A pilot program sponsored by AID through CDC in Upper Volta has established a continuing reporting system of vital events and disease prevalence in a portion of the Mossi Plateau. The costs and technical input required for this limited project appear to be prohibitive in terms of potential expansion or replication by either the GOV or other governments. It would appear that the development of data sources apart from the type of sample surveys proposed in conjunction with census projects are not likely to receive governmental priority.

While birth and death rates in the region have probably varied little in the past decade, substantial changes in regional migration patterns have

occurred which will have a significant effect on the population of individual countries for some time to come. Migration between the Sahel states is the major demographic concern of the governments and the one for which there is the least useful data. As a relatively homogenous region in terms of economic opportunities, migration within the French-administered region of Central West Africa was fairly well limited to the long-established seasonal migratory movements of herders and agricultural laborers. With independence, the establishment of geographic boundaries economically stratified the region, creating areas of excess and inadequate manpower resources. Movement was originally encouraged not only by the recipient countries but also the countries of origin, in that due to traditional attitudes, migrants were certain to return to their homeland during slack seasons, bringing with them a good share of their earnings. As economic gaps between countries widen and traditional family and national ties diminish, labor-exporting nations are beginning to recognize a growing disparity between decreasing renumerations of foreign-earned currency and the loss of the younger, more productive element of their labor force; but difficulties in controlling border crossings, combined with a lack of alternatives to induce laborers to remain on their ancestral soil, provide little promise in changing the recent pattern of migration. On the other hand, countries favoring immigration have begun to consider the potential problems created by large enclaves of foreign nationals. The decision to control migration rests largely with these governments and the nature of that decision, whether it be mass expulsion of migrants or a gradual slowing down of present levels of immigration, will largely determine the capability of labor-exporting nations to deal with the situation once this form of easing population pressure is blocked. At present the migration factor of the population problem is the most rapidly changing and least studied element. Its implications are political as well as economic and its solution can only be made in a regional context.

IV. Family Planning

With perhaps the exception of Mali, where the government has publicly given its support to family planning, the Sahelian countries have no official programs for the delivery of contraceptive services. Permissive attitudes allow the importation and private marketing of contraceptives, sometimes in the guise of health devices and sometimes contrary to antiquated French legal codes which still persist, but, in total, their dissemination is limited to the advantaged urban populations. High infant mortality and religious conservatism have been identified by the officials as popular constraints to any widespread birth control program. Where services are provided they are inextricably buried in an expansive program to generally upgrade Maternal and Child Health. Basically lacking the infrastructure and financial support to extend full MCH programs beyond the most populous areas, government reliance on the demand for contraceptive services under these programs for providing the justification for open endorsement of family planning would appear to be contradictory to the method. On the other hand, in several cases where in the past AID population funds have been utilized in the absence of general health funds to support family planning through the MCH structure, the provision of contraceptive services has been at most token, with these governments emphasizing the development of physical structures over the extension

of services. At the technical level, medical professionals appear to be more favorable to family planning, at least on an individual basis. Training of medical personnel outside their country, where family planning would be included in their program, would be most desirable; however, such training is presently restricted to physicians or upper-echelon paramedical personnel whose numbers and practice are limited. As nations press for local medical education programs, these opportunities diminish. The regional WHO training school in Lome provides theoretical instruction in contraceptive methods, but due to the past official Togolese attitude towards services, could not provide clinical practice. There is at present no combination of educational and clinical facilities within the region which could serve as a regional center for training family planning personnel, nor would it be practical to create such a center for family planning training alone.

The development of private national associations around family planning objectives may offer the means of least resistance for introducing contraceptive services in those countries where governments are politically sensitive to the straightforward introduction of official programs. Experience has demonstrated that government officials may be willing to permit or even endorse indigenous private family planning associations while maintaining a conservative or negative official position. A private association has been active in Dahomey since 1971 and functions in close coordination with government MCH services. Groups have organized in Senegal and Upper Volta, with the promise of cooperation from the Health Ministries of those countries. Proposed family planning activities by a private group in Cameroon have been assured noninterference by the government. A group of interested civic leaders in Togo have drafted a charter for a private association and are confident that government approval will follow. The regional office of the International Planned Parenthood Federation has increased its activities in recruiting national private organizations as formal associations in the federation. Although private associations cannot be regarded as the complete solution to the need for family planning delivery systems, they can assist in easing governmental timidity in venturing into a potential politically sensitive area by surfacing the demand for contraceptive services.

Inasmuch as several of these groups have themselves grown out of more generalized social service organizations (the impetus for the formation of the private organization in Upper Volta came from the Association of Voltaic Women and in Cameroon, family planning services are proposed under the MCH program sponsored by the women's arm of the national party), similar social activist organizations and professional affiliations dedicated to social reform can potentially be brought into action in changing both official and individual attitudes toward family planning. Under a worldwide program coordinated by the Law and Population Program of the Fletcher School of Law and Diplomacy, legal committees in four countries of the region--Ivory Coast Senegal, Dahomey and Togo--have organized programs to review existing legal codes relevant to the right of individual couples to determine family size and the responsibility of the government to provide services. In March 1975 the Program will sponsor a regional seminar for Francophone African countries in Togo to arrive at a consensus of necessary legal codes government should adopt to facilitate national population growth policies and to establish a regional mechanism for the exchange of information and technical assistance in achieving these reforms. (See Table 6.)

Legal Status on Fertility Control		Cameroon	CAR	Chad	Dahomey	Gambia	Gabon	Guinea	Ivory Coast	Mali	Mauritania	Niger	Senegal	Togo	Upper Volta
PILLS:	Importation	P	P	P	P[2]	(NR)	P	P	P[2]	(NR)	P	P	P[2]	P	P
	Manufacture	P	P	P	P		P	P	P	(NR)	P	P	P	P	P
	Sale/Distribution	P[1]	P[1]	P[1]	P[1]		RP	P[1]	P[2]		P	P	P[2]	P	P[1]
	a. Display	P	P	P	P		P	P	P			P	P		P
	b. Site						PH								
	Advertisement	P	P	P	P		P	P	P		P	P	P	P	P
	Transportation	P	P	P	P		P	P	P		P	P	P[2]	P	P
IUD:	Importation	P	P	P	P		P	P	P[2]	(NR)	P	P	P[2]	P	P
	Manufacture	P	P	P	P		P	P	P	(NR)	P	P	P	P	P
	Sale/Distribution	P[1]	P[1]	P[1]	P[1]		P	P[1]	P[2]	(NR)	P	P	P[2]	P	P[1]
	Display	P	P	P	P		P	P	P		P	P	P	P	P
	Advertisement	P	P	P	P		P	P	P		P	P	P	P	P
	Transportation	P	P	P	P		P	P	P		P	P	P	P	P
CONDOMS:	Importation	P	P	P	P	(NR)	P	P	P[2]		P	P	P[2]	P	P
	Manufacture	P	P	P	P		P	P	P	(NR)	P	P	P	P	P
	Sale/Distribution	P[1]	P[1]	P[1]	P[1]		P[1]	P[1]	P[2]	(NR)	P	P	P[2]	P	P[1]
	Display	P	P	P	P		P	P	P			P	P		P
	Advertisement	P	P	P	P		P	P	P	(NR)		P	P	P	P
	Transportation	P					P				P			P	
VOLUNTARY STERILIZATION: General Criminal Law Applicable		X	X	(X)	(X)	X	X	X	X	X	X	X	X	UC	(X)
ABORTION RESTRICTED: To save life of mother:		X	X[3]	X[3]	X	X[4]	X[3]	X[3]	X[3]	X[3]	X[3]	X[3]	X	X[3]	X[3]
To save health of mother:		X				X[4]									
For humanitarian reasons; rape		X													

Legal Status on Fertility Control -- Notes 2

P Prohibited

RO Required Prescription

PH Site: Pharmacy

NR No Restriction

UC Unclear

() Inference from de facto situation

1 Forbidden as contraceptive, but available for health reasons

2 Actual practice appears to be different

3 Country under former French rule which presumably has enacted or retained a provision similar to that of Senegal (Decree No. 67-147 of February 10, 1967), which permits abortion to save the life of the mother.

4 The English case Rex v. Borne, (1939) 1 KB 687, would presumably apply, thereby permitting abortion to save the life or the health of the mother.

V. Development Objectives and Fertility Behavior

In general, birth rates in West Africa are among the highest in the world, although considerable variation exists between the individual countries. Equally awesome are the extremely high death rates, especially in that age group 0-5 referred to as child mortality. As described earlier, the quantity and quality of baseline demographic data for the region is minimal; it is therefore not the least surprising that information explaining fertility differentials within the region (and within individual countries) is practically nonexistent. Numerous theories exist regarding the socio-economic and psychosocio elements of fertility behavior, but none have been adequately tested in the region.

Much of the popular speculation in regard to these issues is based on observation and generalizations of descriptive evidence. In that some of these theories have been incorporated to a great extent in the official African attitude toward fertility-related programs, they command much greater importance then their factual base merits. One of the most persuasive official rationales used to justify the lack of governmental support for contraceptive services is that public demand for children still exceeds the supply and that with the exception of the higher social strata there is no real desire to limit fertility. Various "facts" are cited in support of the need for large families--"economic", the value of child labor and the need for old age security; "social", the system of obligations in the extended family and the status of women in a polygamous society. Another rebuff is directed towards the need for modern methods of fertility control, citing such conditions as reportedly high female sterility and traditional values for child-spacing achieved through abstinence as evidence. Beyond these arguments, of course, is the more generalized matter of the relationship between economic development and fertility and the belief that fertility rates will decline with modernization and without intervention.

These official arguments all assume a bipolarity between modernized and traditional society to which generalizations, if applied, describe only one particular segment at one given point in time. On the contrary, the Sahel is in a period of rapid transition, as evidenced by recent patterns of permanent migration, urbanization at 2-3 times the rate of natural increase and the resultant disruption of traditional family structures and dissolution of land ties. From some of the research that has been done, two isolated studies of the traditional child-spacing concept, divergent variances in the popular belief that birth intervals in rural society are maintained at $2\frac{1}{2}$-3 years were demonstrated. In coastal Togo (Kumekpor, 1970), even with the desire to space births at culturally prescribed levels still widely held, actual birth intervals were much shorter due to a lack of knowledge and acceptable means to do so, resulting in a growing social acceptance and individual practice of abortion. In rural Niger (ORT, 1973) the actual desired birth interval was shown to be decreasing from what had been traditionally held as the ideal. One might therefore suspect that the relationship between modernization and fertility decline is not as direct as supposed.

From a global perspective, it has been suggested that the demographic transition from high birth rates, high death rates to low birth rates, low death rates through modernization is not a linear process. Moreover, it is most likely (Blumberg, 1975) that in a continuum of societal complexity from pre-agricultural activities to modern industrial societies that the demand for children is higher in the middle stages, increasing in the transition from nomadic to horticultural and from horticultural to agrarian. There are indications that fertility may be (among other factors) determined by the participation of women in subsistence production, and the compatibility of female labor with simultaneous child care. Evidence also exists that controls on the demand for children are available at all levels and are purposely applied according to the knowledge and availability of technology--these methods include infanticide, either direct or indirect through neglect; abstinence; abortion; and modern contraceptive methods--although they vary greatly in efficiency and acceptability. Furthermore, in the same way that manipulation of these controls (e.g., improved technology, education) can influence the attainment of demand levels, manipulation of the determinants of fertility can also influence demand itself.

It is not only the outcome of development (e.g., income, education, etc.) but also the mode of development which influences fertility. To this extent, an emphasis on production alone in Sahelian development programs might result in influences on fertility behavior that are in conflict with measures to achieve fertility reduction. In the context of planned changes in the techno-economic base of rural African society, consideration must be given to the impact of the probable effects on fertility.

Program Strategy

1. While present demographic data may be insufficient in terms of what is desirable, it is nonetheless workable when combined with advanced methodologies for estimating population change. In September, 1974 at the request of AFR/CWR, the Bureau of Census proposed detailed demographic profiles for all Sahelian countries to provide consistency in the overall DAP assessment. Upon completion of the initial DAP field work in November-December 1974, BuCen undertook macro demographic projections of the whole of Sahelian Africa. The results included in the population narrative of this report represent but the initial efforts to summarize the findings of this investigation. The model (LRPM2) used for these projections which operates on a rather minimal amount of data such as that available in the Sahel, was designed to integrate data from demography, economics, health, education, and other areas to demostrate the impact of population dynamics on development potentials. Only the early sections of the model were run for the individual countries, requiring additional data input for more sophisticated projections. In developing the full regional projection much of the data needed for country projections was obtained. The work now remains to run the full planning model for each of the Sahelian countries in addition to the analysis of these results and the results of the regional projection.

These projections will serve as reference documents for future Bureau and Mission assistance strategy, for discussions with other major donors in arriving at a cohesive and complementary approach to development assistance in the region, and with regional and rational planning agencies in the attempt to establish more rational and comprehensive program planning. Should more adequate and consistent data become available during this process, it will be incorporated in a revision of the projections. It is assumed that a consensus on the consequences of population growth in the Sahel can eventually be achieved.

2. The Office of Population in recognition of the gaps in the knowledge of both the consequences of population growth and the determinants of fertility needed to effect more adequate national policies has developed a strategy to improve the store of knowledge on the interactions between demographic and development variables. The policy-related issues identified in the preceding overview fall within areas of prime importance in this strategy. Social science research on the determinants of fertility in the Sahelian region should give priority to those questions which are related to major development assistance projects in the region, such as those relating to migration and resettlement; changes in the agricultural production base; and in the status of women and family structure. Future project development should incorporate a regard for the effect of socio-economic change on fertility and consider alternative approaches to development compatible with the attainment of a more rational rate of population growth.

3. Contraceptive services should be made available as rapidly and in the most direct manner possible. At present,however, the insistence

by the governments of the Sahelian countries that family planning be instituted only within the framework of comprehensive Maternal and Child Health programs poses difficulties in direct bilateral assistance for contraceptive services. In a lack of corresponding assistance to support the development of MCH infrastructure perceived by these governments as being prerequisite to the introduction of fertility control programs, few opportunities are foreseen for government level family planning assistance. Alternative strategies are therefore proposed in line with existing AID centrally supported programs:

-- Identify individual medical professionals from these countries and provide training in fertility control techniques, with an assured continuing supply of commodities and equipment.

-- Encourage efforts of IPPF to establish local associations and assure sufficient levels of commodity assistance through central procurement programs to provide adequate contraceptives to IPPF affiliate clinics in the region.

-- Through centrally supported intermediaries (e.g., Pathfinder, FPIA/CWS) provide family planning program assistance to private social service organizations.

-- Develop regional capacity to provide necessary information and consultation to assist legal change effecting broad distribution and use of fertility regulation methods.

There remains an urgent need to develop indigenous training capabilities for the broadest range of family planning personnel. Priority should be given to the establishment of a model center as soon as the occasion arises. Such a center would necessarily be affiliated with an on-going MCH operation and would ideally become linked with an institution that draws participation from other countries of the region.

AID BILATERAL ASSISTANCE TO SAHEL COUNTRIES

Cameroon — USAID has assisted in a multidonor project for the development of a regional institution for training physicians and other health workers (University Center for Health Sciences).

Funding: Cumul. Obligations thru FY 73 - $2.58 million
OYB FY 74 - 0
Proposed FY 75 - $75 thousand
Proposed FY 76 - $70 thousand

Others — No AID bilateral projects in past or present. Project is being proposed in Togo for FY 76.

AID REGIONAL AND CENTRAL FUNDED ASSISTANCE TO SAHEL COUNTRIES

Cameroon
--Research on demographic history

Dahomey
--Study on population dynamics among persons practicing vodun
--Demonstration of a pilot maternal/child health/family planning clinic
--Support to the center for family orientation
--Midwife training PPA Chicago

Gambia
--Demonstration of a pilot maternal/child health/family planning clinic

Ivory Coast
--Study on factors affecting Ivoirian child

Mauritania
--Grant towards establishment of maternal/child health/family planning clinic

Niger
--Demonstration of pilot maternal/child health project
--Grant for the production of family planning film

Senegal
--Support for maternal/child health/family planning programs

Togo
--Grant towards production of maternal/child health/family planning literature

ASSISTANCE FROM OTHER DONORS TO SAHEL COUNTRIES

Cameroon
--International Statistics Center in Yaounde: Demographic study.
--United Nations Development Program: Fellowships
--Family Planning International Assistance: Provision of medical equipment
--Church World Service: Technical advice in family planning program
--Pathfinder Fund: Provision of contraceptives and travel grants
--Population Council: Fellowships
--Governments of Canada and France: Participation in multi-donor project.

Dahomey
--Family Planning International Assistance: Provision of contraceptives
--Pathfinder Fund: Grant to expand family planning services.
--OXFAM: Grant for a vehicle and maintenance.

Gambia
--IPPF: Technical advice and grant to Family Planning Association.
--Pathfinder Fund: Grant for medical supplies to Family Planning Association.
--Population Council: Study of local population situation.

Ivory Coast
--Pathfinder Fund: Travel grant
--Ford Foundation: Travel grants

Mali
--Pathfinder Fund: Provision of contraceptives

Mauritania
--IPPF: Travel grants

Niger
--Population Council: Survey of local attitudes, practices, and knowledge.

Senegal
--UNFPA: Technical advice for population migration and fertility study
IPPF: General technical advice
Pathfinder Fund: Technical advice and training of para-medicals

ASSISTANCE FROM OTHER DONORS TO SAHEL COUNTRIES - CONTD.

Togo

--WHO: Refresher course for rural midwives.

--Pathfinder Fund: Provision of contraceptives

--Unitarian Universalist Service Committee: Technical advice to develop health services.

--Population Council: Fellowships in family planning

--Ford Foundation: Fellowships in family planning.

Section Two: Program Conclusions and Project Recommendations

I. Introduction

Perspective: The single most important conclusion we draw from this review as we look ahead to the development of the Central West Africa area is that countries and donors must develop a framework of action which permits attention on the one hand to the more immediate human needs arising from the vulnerability of the area to drought and similar calamities, and which at the same time permits action on the longer term development of new resources and new bases of economic strength.

There cannot be a continual conflict over the question of whether short-range or long-range programs are most suitable for this area. The balance of effort will always have to be adjusted as new situations arise. To concentrate only on the short-term would condemn the area to a marginal economic existence (and to a dependence on outside largesse) forever. To concentrate only on the long-term would ignore the human factor of the situation and the extreme vulnerability of the area to drought and to food shortage. It would be to forget the responsibility of local governments and of international donors to the people most at risk in drought situations. Consequently, the DAP recommends that AID be prepared to continue to program funds flexibly, as in the R&R program, to meet immediate needs and to overcome short-run obstacles to local capacity to produce and transport food, while at the same time we contribute to long-term development programs.

Closely related to this "short vs. long-term"issue is the argument over whether greater emphasis should be placed on the potential of the river basins, and of the higher rainfall areas on the one hand, or on the development of dry land agriculture and livestock on the other hand.

The potential of the river basin cannot be ignored. They offer not only the opportunity for agricultural surpluses through intensive irrigated agriculture, but also for power, navigation and mineral development. All of these together may hold the best chance for this area to break out of a marginal dependent state of existence.

Yet the whole future is not in river basins alone. Pockets of concentrated development by themselves cannot meet the needs of the whole region, and indeed could create serious imbalance which would worsen equity ratios and threaten economic and political stability.

Moreover, the drought has demonstrated that food surpluses in the higher rainfall areas, assuming there are any, cannot always be transported to other regions of the area, either because the transportation system is inadequate or because the costs are prohibitive. Consequently, many Sahelian countries are revising their earlier plans in order to provide for a more geographically balanced food production strategy. Finally, one cannot ignore conclusions drawn by the MIT Report, which drew attention to the potential that exists for dryland agriculture in semi-arid zones where proper conservation and cultivation practices are applied. We conclude, therefore, that A.I.D. needs to balance its assistance program in this area to respect the development potential of both the river basin and dry land areas.

The third and final major conclusion we draw from this review is the importance of increasing human capacity in this area for development activity. The history of the region shows the extremely limited capacity of structures and institutions which are foreign-dominated, foreign-managed, and indeed, conceived by foreigners. We believe that every development activity, if conducted properly, presents an opportunity to enhance the skills and experience -- hence the capacity -- of the people in the area. Something was made of this opportunity in the R&R program, which was geared to local capacity and administered in such a way as to maximize local responsibility.

There is required now a new style of longer-term assistance, one which builds into each project the opportunity for host country conception, design, management and implementation. This style would stress learning by doing, as well as formal training. This style would entail less emphasis on the technical perfection (by foreigners) of the advance design of projects, and more emphasis on new understanding and experience gained in the course of projects.

The increase in capacity is needed at all levels throughout the region: by farmers and herders, field agents, managers, scientists, planners, and high level officials alike. If one looks upon development in the Central West Africa Region as a 20-30 year task, as one should, perhaps the primary goal for the end of that period should be a generation that has achieved a new level of development skills and experience.

Professor Robert Kates, at the October 1974 Bellagio Conference on the Sahel, provided a schematic approach to the problems of the Sahel that, with modifications made here, can serve to encapsulate the approach recommended above for the entire Central West Africa Region. It places into perspective the several different aspects of the development task in the region (short and long term, river basin and dry land areas), and helps to characterize the opportunities and purposes of the programmatic intervention recommended in this section (See "Development of the Sahel", following).

DEVELOPMENT OF THE SAHEL

Major Objectives	Major Opportunities	Example of AID Actions in Process or Recommended
1. Prevention of future drought disasters and food shortages	a. Better understanding of climatic variables; early warning systems on meteorological, vegetation and nutrition factors	(i) ERSATS Study of remote sensing potential, (ii) Request to NOAA for feasibility study, (iii) Strengthening of IFAN, (iv) aid to CIEH
	b. Increased productivity of pasture and crop lands in support of balanced food production and distribution system	(i) Country and Regional programs in agriculture and livestock, (ii) Research
	c. Quick response to future emergencies such as pests, floods, transport bottlenecks	(i) Continued use of R&R mechanism, (ii) multi-donor coordination on emergency needs, (iii) revitalization of certain regional mechanisms
2. New resource development	a. River basin development	(i) Strengthening regional river basin organizations for planning and program execution, (ii) Participation in infrastructure and land preparation investments, (iii) Strengthening donor coordination
	b. Building a road and communications network	(i) Reconsideration of Road policy, particularly regarding secondary roads (ii) Encouragement of other donors to construct roads, (iii) Assist in building road maintenance capability.
	c. Utilization of minerals	(i) Mineral surveys, particularly for phosphates

Major Objectives	Major Opportunities	Example of AID Actions in Process or Recommended
3. Increased capacity for development activity. (expansion of absorptive capacity)	a. Strengthening education system at all levels	(i) Build local participation into every aspect of development programs, with the accent on increasing host country planning, design, management and implementation experience; (ii) Rural literacy and education programs as part of agricultural, livestock and health projects
	b. Better links between agricultural research extension and farm problems	(i) Training of African researchers and support to Africanization of national research systems; improved links between national research systems and international research network
	c. Improved health status	(i) Assistance to rural health delivery systems; (ii) participation in regional onchocerciasis program (iii) Environmental health planning.
	d. Transfer of technology and scientific skill	(i) Support for the proposed Sahel Institute to build African capacity to research new sources of energy, adopt modern technological innovations, attract more resources

The programmatic conclusions which follow in this section do not address all of the objectives above. Some,like road building and communications,are more appropriate to other donors. In nearly all cases, in fact, AID's role will be part of a larger complex of activities in which other donors are involved to a greater degree. Yet the US has some role to play in most of these areas: its scientific leadership is critical to efforts at early warning systems and to the longer run transfer of scientific ability through the proposed Sahel Institute; its agricultural experience is most relevant to food production programs in both irrigated and dry-land agriculture; its emphasis on human resource development can be an important influence not only in the areas of education and health but on the style of programs in livestock and agriculture. It should continue to be part of AID's strategy, moreover, to promote a balanced view of the development task among the international community, encouraging fund allocations for emergency needs such as drought and relief, and for the critical longer-term developments such as the river basins; for irrigated agriculture and for the wise use of the dry lands. This rate will involve continued work through the DAC, CILSS, the National Academy of Science and other bodies to promote better conceptualization of the problems and more effective arrangements for resource transfer and utilization.

Regional and bilateral approaches. The specific programmatic conclusions presented below fall into two categories: regional and bilateral. For AID which has heretofore worked largely through regional programs in this area, it is important to distinguish between objectives which can be met through regional programs and those that can best be met through bilateral country programs.

The DAP concludes that regional efforts will continue to be essential but that it is important to distinguish between two types of regional effort. One type is involved wherever the problem to be solved is regional in character, that is, where the problem cannot be solved by one country alone within national boundaries. An example of this occurs in river basin development (e.g. OMVS). An activity directed towards this end may be termed a regional program. The second type is involved wherever the provision of a given service may be more economical or more efficient if provided through a regional mechanism. An example of this type of regional activity is the Lome Regional Road Maintenance Center. This type may be termed a regional vehicle. A regional vehicle can be used to assist in either a regional or national problem; its value, however, is in its efficiency in doing so.

The distinction between a regional program and a regional vehicle is important to make when forming judgements on AID strategy. This distinction is also important when calculating the ramifications

of individual projects. Every regional program or problem must be dealt with on a regional basis to some degree, even if national decisions and implementations are also critical elements. Thus, for example, if AID is concerned to increase the effectiveness of the Niger River Commission, AID must reckon the effect on that regional objective of AID's bilateral assistance to train Malians in water management techniques. A regional vehicle, on the other hand, deserves to exist only so long as it offers more efficient or effective service than do national programs. If AID bilateral support should strengthen a national service at the expense of the regional vehicle no damage is done. The vehicle need not be clung to as better alternatives arise.

Obviously, some regional mechanisms serve both the function of a program and a vehicle, or are thought to do so. The Entente, OCLALAV, OCCGE, and other regional mechanisms have to be evaluated, however, in this light: their importance in dealing with a truly regional problem (program); and/or their efficiency as a vehicle of services in the region.

The DAP review concludes that there are important regional problems that should be addressed by AID through regional programs. Examples are the river and lake basins, environmental health, and livestock marketing. The DAP review also concludes that there are a number of problems, both regional and national, that can best be addressed through regional vehicles, both as a means of husbanding scarce resources and of promoting an exchange of ideas. Examples of these are health planning, agricultural research, population, training in program planning and project management, and other forms of advanced training.

Along with these regional efforts, the DAP recommends much larger and more significant country level programs, largely on a bilateral basis, than AID has undertaken in the region before. This recommendation does not signal a retreat from regional goals or from a region-wide strategy. Bilateral programs are viewed, rather, as a necessary complement to regional activities. National programs are essential to the success of development objectives in every sector. Even where program objectives are regional in scope, major decisions are made at the national level affecting resource allocations, training, the selection of sites for development programs, and, indeed, development priorities within the region. Furthermore, it is within national government systems that delivery systems are devised and supported in the fields of agriculture, education, and health. Wherever AID hopes to play a significant role in the policy of these sectors or in the fashioning of an effective delivery system, AID must have some impact on the national level programs. This does not mean that AID necessarily should have a bilateral program in every country in Central and West Africa. The degree of our bilaterial assistance should be a function of (a) the extent of our

objectives, (b) the magnitude of need foreseen, and (c) the lack of the existence or the adequacy of regional vehicles which could be used to support national programs.

II. Regional Programmatic Conclusions

A. River Basin Development

1. Summary

A striking feature of the Central West Africa Region is that here large areas prone to periodic drought co-exist with several great river systems: the Senegal, Niger, Volta and Chad. Not surprisingly, here as elsewhere in Africa, river basin development is seen as perhaps the only means of fundamentally transforming the economy. By this is meant the harnessing of the rivers to achieve self-sufficiency in food supply in the face of recurring drought and a modest prosperity based on hydro-electric power, irrigated crops for domestic consumption and export, and new methods of river transportation.

Although underground water resources are important in some areas and small pump schemes are attractive, major transformation proposals have received the main emphases. Year round control of water in the main rivers requires major structures; hydro-electric power generation requires a large store of water; and water transportation networks require regular depths of water, year round. Thus plans for a number of large dams are currently under serious study, including the Manantali and Diama dams on the Senegal river and the Selingue, Fomi, and Knadadju dams on the Niger river, in addition to a number of small projects in the Lake Chad basin.

In the wave of interest in the area resulting from the recent drought, many of these projects are receiving urgent attention from potential donors.

River Basin Characteristics. The integration of streams into networks creates a range of problems and defines a set of opportunities. Rivers are an integrated physical system: hydrological, ecological and geomorphological. These physical facts impose constraints on the patterns of development in any drainage basin. Major interference with one part of the system can have far-reaching effects on the whole system. Yet interference is necessary if the seasonally skewed flows are to be turned into regular, twelve month supplies of water.

Almost all large river basins in Africa have another characteristic which constrains development: they are international. Inter-related physical systems are shared by up to nine different nation states. This is in part a reflection of the small size of some African nation states and of the somewhat arbritary nature of colonially defined bondaries. But it is also in part due to the physical nature of this part of the continent, to its size and the generally flat topography which favors large basins.

River Basins: A New Resource for Development. Many countries in Africa have already embarked on major water resource development programs. Their experience is useful in assessing the water potential of the Central West Africa Region. In any assessment of any river basin project, however, it needs to be kept firmly in mind that while some schemes may be instant successes or failures, it is the long run changes which are most important. In fact, some uncoordinated river basin development in the CWR is already underway, but it will take perhaps twenty to thirty years before the transformation effect of this work is well established. There is need to plan for economic returns within a much shorter period than this, but without ceasing to work steadily towards the long range goals.

The current assessment of river basin projects in other areas of Africa is that while some exceedingly large structures have been built across the Nile, the Volta, the Zambesi and other Africa rivers with impressive results in the production of power and the extension of irrigation, no scheme has achieved an unqualified success. Some at present are not repaying adequately the vast outlays made. Of the numerous problems encountered, some were hydrological and geomorphological as on the Nile, biological as on the Zambesi and the Nile, and socio-economic as on the Niger. In a few cases the adverse social and political ramifications of water resource projects have been so severe as to throw into question the value of the entire scheme. The risks of large water schemes are plain. Ecological and socio-economic side effects of dam construction provide unexpected and often harmful consequences, while the economic benefits anticipated are not always realized. This experience points to the need for extremely careful and thorough planning.

The success of the Gezira scheme and its modern extensions in transforming the Sudanese economy is a model which no other country in Africa has yet been able to reproduce. The Gezira scheme was started in the 1920's and took many years to reach its present high level of operation

The opportunities for river basin development do indeed exist in the CWR area but the successful attainment of national goals will demand a carefully integrated stage-by-stage approach to the problem. At present there are few signs that the need for such an approach is fully realized. While the water resources do provide the basis for a major development thrust, many constraints need to be understood and overcome. For instance, the development of water resources can also provide the "delivery system" for some endemic diseases and the costs of providing adequate health services must be included in project planning.

Given the existence of good water resources, or irrigable land, and given a supply of capital for dam and barrage constuction, careful attention must be paid to the way in which the use of physical resources

may affect the socio-economic circumstances of a country, including its internal marketing and pricing policies, as well as its export market possibilities. Another major area requiring attention is the steady upgrading of technical and managerial capacity to match the growing use, and sophistication, of the water resources system.

The dilemma is that the physical regime of the water systems impose a need for year round water storage. Year round water storage is most readily achieved by moderate sized or large dams. These have the advantage of providing a major transformation possibility, often with power and navigation benefits. At the same time, however, such projects can inflict major stress on the technical, managerial and infrastructural resources of the country. These large schemes can be the focus of change; but they can also destroy the economic and environmental base of livelihood for certain segments of the population.

Smaller schemes, though, particularly in areas where a long-term indigenous experience of water control is lacking, can serve as an immediate learning stage and thus act as an indispensable part of longer run development approaches.

The U.S. is not likely to be a leading contributor to the large capital intensive investments being planned for the main waterways in the Region. But it is appropriate that the U.S. should be involved in these projects as part of a continuing interest in the Region for the following reasons:

First, river basin development is a high priority in the plans of the nations concerned. If this is to be a leading sector of development, the U.S. should consider carefully the most appropriate contribution it can make.

Second, water resource development and irrigated farming are major areas of U.S. expertise; not only do we have the technology and the experience, but also we have some awareness of the range of problems involved in the transformation toward modern water use.

Third, assistance to this sector can fit well into AID philosophy and approaches to other sectors; we can bring benefit immediately to farmers through investment in small projects, we can help develop local skills through on-the-job training and working seminars and we can help build up higher level expertise by carefully planned short term training programs.

Given the interests of other donors, and taking into full account the present Congressional charge to AID concerning large capital projects, the particular goals of AID in water resource development should be:

1. To immediately build up farm level experience in better methods of water use.

2. To encourage a variety of approaches to better water use and help choose through pilot projects appropriate methods for each region.

3. To help the national governments and regional organizations develop a planning and evaluation capacity for water resource use.

4. To help the governments concerned with the several river basins develop improved methods of coordination of the development of the water resources of the area.

5. To assist the governments plan water resource use for regional crop and development needs in different parts of the countries concerned.

Methods of implementing such broad guidelines will vary from basin to basin. A continuing search for effective forms of international cooperation will be necessary. Assistance in the evaluation of the impact of proposed basin development projects will need to be provided. In the Senegal Basin, technical support for OMVS should continue. In the Niger Basin, the work of the Niger River Commission should be supported and new networks of collaboration encouraged. In the Chad and Volta basins, assistance should be considered for international coordinating bodies as the need arises.

At the individual project level the U.S. should provide assistance for several small scale water use projects, provided that these projects can be used as a basis for training at several different levels. We recommend the encouragement of the close evaluation of these projects with a view to improving future larger scale irrigation design. At the same time, AID's own interlinked evaluation will provide a basis for assessing our own further involvement in this area.

The Onchocerciasis vector control program initiated in FY 1974 is a multi-donor regional program which will eventually free 70,000 km^2 of fertile river valley land. This will provide a major opportunity for the countries concerned to create new, viable agricultural communities. Program recommendations to support development of these areas are discussed elsewhere in Section II.

In sum, the improved use of water resources is vital to the long run development of the CWR region. The five year period envisaged by the present document is not sufficient to see major returns from in-

vestment in water development. It is, however, the period during which a good foundation can be laid for effective and sustained growth in this sector. Well conceived U.S. assistance during the next few years may be a critical factor in the establishment of such a base.

2. The Senegal River Basin - Introduction

The countries of the Senegal River Basin -- Senegal, Mali and Mauritania -- are poised on the threshold of an enormous venture. After more than a decade of organization, planning and study, the development of the Basin is about to become a reality. The summary plan encompasses $3.2 billion of investment, keyed to the construction of two dams, navigation and port facilities, inland transportation facilities, and the development of agro-industries and mining. Financing for the first dam, the Delta Dam at Diama, is largely assured (from FAC, with possible IBRD participation), with a target completion date of 1979. The Delta Dam will permit 30,000 hectares of land to be irrigated and farmed intensively. Financing of the much larger Manantali Dam in Mali and of other infrastructure may also become available soon, possibly from China and/or Arab countries. If it does, the prospect in 35 years is for 428,000 hectares under irrigated cultivation. Countries now in deficit in virtually every major cereal crop will become self-sufficient, or even exporters. Beyond agriculture, there is the prospect of electric power sufficient for new industry and mining, and of a system of river transport opening up inland areas as well as the Delta itself.

But the 35 years of development will be demanding. In Mauritania today, only about 600 hectares per year are being added to the irrigation total, compared to the 6,500 per year projected at the outset of the Basin's development plan. And even this current tiny expansion is exhausting Mauritania's trained manpower, which is itself heavily dependent on expatriate personnel. Senegal, the principal recipient of agricultural benefits from the Basin, is more advanced. But even in Senegal scarcely more than half the amount scheduled for development by 1980, 41,500 hectares, is currently being prepared for development. Senegal's plans, too, are heavily dependent on outside expertise, both at the senior level of its planning agency for the Delta (SAED) and at the project level.

The projected agricultural returns will also demand great strides in development of technological packages, extension and incentives to farmers. For example, the plan calls for going from four tons/hectare in rice production in 1980 to six tons/hectare in the future. Few farms in the basin are presently producing as much as two tons/hectare. The results of four tons or more achieved on research stations or special farms have not yet been repeated on a large scale. In sum, a tripling, rather than a 50% increase, in yields is required to meet plan targets.

The economic and financial aspects of the plan are equally sobering. The returns on the investment are projected to be sufficiently high to provide for an end to external financing in ten years. But that assumes (a) the pace of land development will be achieved as planned, (b) crop increases will be dramatic rather than painstakingly slow as in most programs, (c) the internal economies of the countries will permit prices for food to rise to the point of covering not only capital costs of irrigation development but other inputs such as fertilizer, pump repair and fuel, that is, prices close to those of the world market, and (d) the governments will be able to capture 75% of the returns for reinvestment, a figure well beyond the current reinvestment rate of any programs now in operation.

All of these considerations suggest that the Basin development should be seen in a much broader and longer time framework than presented in the formal program of the OMVS (Organization pour la Mise en Valeur du Fleuve Senegal). The need for the Basin's development becomes obvious as one moves away from the Basin itself to the larger area. Senegal is gripped by the annual importation of more than 300,000 MT of grain, most of it rice, fully 20% of its imports. Increases in rice production are possible in the Casamance Valley in the south, but it is doubtful that these can be substantial enough or sufficiently in advance of population growth there to meet the needs of the cities. Intensive production along the now sparsely populated Senegal River seems to be the most promising answer to the deficit. Mali achieves the smallest amount in direct agricultural benefits, only 45,000 of the 428,000 hectares to be irrigated. But the power resources will be primarily in Mali, as will the opportunity to open up mining potential in presently depressed areas hard to reach by present transportation facilities. For Mali, with a per capita GNP of less than $80, and a national budget of only $60 million ($13 per person), the development of power, industrial and mineral potential, particularly if these could be closely related to the adjacent Senegal market and transportation system, could be vital to breaking out of a marginal economic position.

For the entire area, the development of the Basin is a critical element in long-range development. Measured in immediate cost-benefit terms, it raises questions of economic and financial viability. But in terms of development over a longer term, from both the political and economic interest of the donor community, it has enormous significance. It is hard to conceive of the agricultural systems of Senegal, Mali and Mauritania ever achieving self-sufficiency without modern forms of irrigation. It is hard to conceive of these countries ever "graduating" from the assistance roles until the potential of the basins -- both Senegal and Niger -- are brought into play. Even though basin development alone cannot solve the problems of the interior Sahel, they still offer the potential economic base in Africa to support

the investments, the markets, and the opportunities for surplus population from these areas. The full measure of these long-term benefits need to be included in an assessment of the Basin development program. In the two worst years of the drought, more than $300 million of emergency assistance was provided to the Sahel. Over the last several years, more than 1,000,000 MT of grain was provided, beyond the commercial import levels which as noted for Senegal alone are over 300,000 MT a year. In a world conscious of food needs, this drain should be reversed.

Moreover, the Basin program is already beginning. Elements of the infrastructure such as the Delta Dam, are being financed. The worst prospect of all, in fact, is that the large infrastructure will be developed, and then go unused or largely underutilized in a world short of both energy and food. Every study made of the Senegal Basin concludes that beyond the infrastructure are enormous needs in land preparation, training, development of irrigation experience, transportation, and agronomic and sociological research. Much of this investment, particularly the training, is under-costed or ignored in the formal plan. Along with the probable delays in the completion and returns from the infrastructure itself, it now appears that at least a 50 year time frame will be required to realise the full benefits of the Basin, with donor inputs going well beyond 10 years. As the recent study by the U.S. Bureau of Reclamation points out, much of this investment in land preparation and training can go forward even independent and ahead of the larger infrastructure projects, and have an impact on agricultural production. But to move forward on the infrastructure without the preparation raises the spectre of an enormous international venture which leaves the countries only huge empty shells, monuments to dreams too early abandoned, the Office du Niger writ a hundred times larger.

The United States has an opportunity to play a critical role in helping in these areas of supplementary investments to the basic infrastructure, thereby enabling this infrastructure to have the intended effect on the food and other human needs of West Africa. The U.S. is not likely to participate directly in the financing of the two dams, nor to a large degree in the navigation infrastructure in which Canada has expressed interest. There are four areas, however, in which the U.S. has special expertise and interest: organization and management of the OMVS, training at all levels in both OMVS and the individual countries, environmental safeguards, and agricultural research and development. If the United States moves to play a positive role in the Basin's development, i.e., indicates its support for the objectives of the OMVS and its willingness to participate with both technical and capital assistance, the U.S. through these areas of activity can have a substantial impact on the returns from the entire investment. U.S. inputs in these and related activities over 5 years might total $50 million, still a small portion of the total investment expected.

Organization and Management

The OMVS is already well advanced in establishing a legal structure to receive funds and to act on behalf of the three member states. The absence of Guinea as a member is a potentially significant problem, should that country move to make investments seriously affecting the river upstream. But the present OMVS structure has succeeded in reaching agreement among its three members on an overall plan of action and a coordinated program of Basin development. However, as the Basin's development moves from the planning to the implementation stage, the OMVS is ill-equipped to receive funds from different sources, to coordinate them, and to execute specific projects. Various donors have decided to support OMVS in the implementation of specific projects. Canada will provide for Design and Engineering of the Port of St. Louis, France, the World Bank and others will assist with the Delta Dam. However, there does not yet exist a donor-coordinating mechanism, nor a formula for the management of OMVS finances.

Since the July 1974 Donor Conference and the October visit of the OMVS delegation to AID/W, the OMVS, the Member States, and in particular President Senghor of Senegal (current presiding Chairman of the Conference of Heads of State) have been concerned with upgrading the Secretariat's ability to negotiate contracts, to supervise and to manage the implementation of Phase I of the medium-term programs. Several steps taken by the organization provide evidence of their determination to move forward in these areas of concern. First, senior members of the Secretariat and the National Coordinating Committees have visited similar river basin commissions in Africa and Asia (Aswan in Egypt, Mekong in Asia), Secondly, meetings of the financial and legal experts of the three National Coordinating Committees have been held to establish the broad guidelines for the responsibilities of the Secretariat, and the creation of regulatory institutions for the operation of the commonly owned infrastructures.

OMVS' concern with improving its level of technical competence has resulted in requests for technical assistance from various donors. Specifically, the role of providing overall technical guidance to the Secretariat has been requested of the UNDP in the form of a four-five man team of high level experts. Canada, Italy, France, and the United States have each been requested to provide two-three experts to be attached to the Secretariat.

At the same time a recruitment program at the level of the three Member-States has been lauched. Finally, President Senghor has proposed that two highly qualified Africans be recruited to assist the Secretary-General with his responsibilities. One would be Director of Technical Services and the other Financial Director.

To help OMVS further improve its structure for receiving, coordinating and executing the various forms of assistance, AID agreed in FY 75 to finance a study of OMVS' organization and structural needs, and to identify the training requirements for OMVS to staff its needs from the member countries. From that study, which should be completed during FY 76, there should be identified specific ways in which AID and other donors can assist OMVS further in its ability to coordinate and move forward the Basin program.

In addition, the U.S. has been instrumental in having the Development Assistance Committee (DAC) of the OECD call a meeting to explore ways in which the donor community can act more in concert in assisting in the Sahel-Sudano region, particularly in Basin development programs. By helping both Africa and donor organizations organize better to utilize funds that are or will become available, AID can accelerate and facilitate the introduction of multi-donor funding. To date, this has been a critical U.S. contribution and it should remain a priority concern.

Training

As noted, the FY 75 funded study of OMVS's organizational and training needs will indicate the training requirements for OMVS. It is anticipated that AID will begin in FY 76 to provide some of this training. The training will probably include general management, engineering, contract, water management, and other forms of technical skills development.

Beyond OMVS itself, there will be enormous training needs within the three countries. As noted elsewhere in the DAP, training is required at the farm level in irrigation and other aspects of intensive agriculture, and at the extension level, in project management, engineering and many other skills. Most of this must be provided through bilateral programs and is thus described in the country sections of the DAP. But such training contributes directly, and is essential, to the Senegal River Basin program.

Environment

In FY 75, AID agreed to finance a study for OMVS of the environmental impact of the proposed Basin development program. This study will examine such matters as health factors related to water development (e.g., schistosomiasis) and to migration into the area; the effect of the program on fisheries, soil, and biological factors; social conditions affected by relocation; and others. From the study will come recommendations for: (a) organization and staffing in OMVS to handle environmental matters, and (b) changes in design or implementation of some aspects of the program to prevent or minimize adverse environmental impacts. AID should be prepared to help finance the implementation of these recommendations.

Agriculture

Following the donors conference called by OMVS in Nouakchott in July 1974, OMVS adopted two important resolutations: (a) the major infrastructure would be commonly owned by the Member States and operated by the regional organization, and (b) all agricultural projects would be implemented by national institutions. This means that development of agricultural land in the Basin would occur largely through bilateral programs. Senegal is the only Member State currently with an experienced organization (SAED) which has the capability of managing the development of irrigated perimeters. For the present, therefore, Senegal offers the best opportunity for such programs. The IBRD, FED and FAC have all agreed on programs with SAED for expansion of irrigated perimeters in the lower valley (the Delta). The timetable for the construction of the Delta Dam also lends itself to the expansion of the SAED program, which is not heavily dependent on construction of the Manantali Dam. There is additional acreage in the Delta not covered by any donor, and it is proposed in the Senegal portion of the DAP that AID begin in FY 76 to assist in development of this area. None of the donors, moreover, are working actively in integrated livestock-agriculture programs. Yet, these are essential for the valley. AID, as noted again in the Senegal section of the DAP, could make valuable contributions in this direction. Actions for Mauritania for FY 77 and beyond are developed in the Mauritania section. These bilateral efforts would likely comprise the major capital contributions to the total OMVS program. However, AID should not rule out capital participation in some of the water and transport projects directly under OMVS which will be critical to the economic success of the agricultural investments.

OMVS does retain responsibility for some of the agronomic research related to the program. AID will, along with UNDP, assist in agronomic research under OMVS in FY 75. Further research inputs in subsequent years would be worthwhile to help maximize the benefits from crop selection, water usage, and land development. For example, some forms of irrigation like sprinkler and drip have been developed in the U.S. and the U.S. has the greatest expertise in them. Whatever research is done under OMVS, there will be a need to maintain coordination with national research programs. This is discussed more fully under the section on agricultural research.

3. The Niger River Basin

The Niger River is an important water resource for six West African nations. The Niger flows north-eastward from the uplands of Guinea, disperses in the lakes and interlaced channels of the inland delta in Mali, touches the margin of the desert proper east of Timbuctou, before sweeping south-eastward through Niger and Nigeria. For part of its course it forms the boundary between Dahomey and Niger and tributaries from Upper Volta are important. Thus Upper Volta, Guinea, Mali, Niger, Dahomey and Nigeria are directly involved in the development of the water resources and irrigable land of the Niger Basin. Parts of the basin also lie in Ivory Coast, Chad and Cameroon.

There are at least three distinct sections of the Niger; the river above the inland delta, the river between the inland delta and the Benue tributary, and the Benue - lower Niger section. The first two sections are characterised by very marked seasonal changes in flow. At peak discharges, about 7500 cubic meters of water a second pass Koulikoro, in Mali, flowing north towards the great inland delta of the Niger; in the dry season less than $30m^3$/sec pass the same spot. At Niamey in Niger, flows range from around $2,000m^3$sec in January - February to $100/200m^3$/sec in June/July. The Benue delta section is much less differentiated in its flow pattern since much of this part of the basin drains regions with higher rainfall.

Each of the six countries involved in the main basin has already made some use of the Niger's water resources. The river is important as a means of transportation in Guinea, Mali, Niger and Nigeria. In fact river steamers can reach Niamey (Niger) from the sea during several months of the year. Irrigation from the river is important in Mali where over 150,000 ha are under various forms of flood irrigation, including 45,000 ha in the Office du Niger, an ambitious project begun several decades ago and located north of Segou. A few thousand hectares are currently irrigated in Niger, but there is little irrigation in Guinea, Upper Volta or Dahomey. There is many times more land with potential for use under irrigation than land currently irrigated, and to date there are few, if any, examples of good irrigation projects in the Niger Basin. The Niger has also begun to be used for power generation, with plants at Sotuba (near Bamako), Markala (near Segou, Mali), Kainji, Nigeria, and Dabola, Guinea.

Current use of the water resources of the basin is thus at a low level. However, each of the six countries involved have significant plans for extending the development of water resources, though each maintains a somewhat different emphasis. In total, some ten to twelve different dam projects are in some stage of consideration, including the Selingue Dam in Mali, the Formi Dam in Guinea, the Kandadje Dam in Niger, a dam on the Beli river in Upper Volta and the Jebba Dam in Nigeria. Power production is the main goal of Guinean, Upper Voltian and Nigerian

projects with subsidiary transport benefits; but in Mali and Niger multi-purpose objectives of water development involve power production, irrigation and transport improvements. If even a portion of current plans are realised, the Niger river will be the scene of major investments within the next decade.

a) Niger Basin Experience With Water Resource Development.

By 1975, therefore, many different kinds of water development projects have been attempted or are planned in the Niger Basin. It is worthwhile to review in more detail the state of developments.

(1) International River Basin Planning. River basin planning for the Niger is the responsibility of the Niger River Commission.

In October 1963, shortly after their independence, the riparian states of the Niger Basin - Guinea, Mali, Ivory Coast, Niger, Upper Volta, Dahomey, Nigeria, Cameroon and Chad - signed an agreement entitled "Act Regarding Navigation and Economic Cooperation Between the States of the Niger Basin" (Act of Niamey). To further the cooperation among the member states, they agreed to establish an Inter-Government Organization which would be "entrusted with the task of encouraging, promoting, and coordinating the studies and programs concerning the exploitation and development of the resources of the River Niger Basin."1/ The composition and functions of the Niger River Commission (NRC) were defined by the 1964 Agreement of Niamey. The Agreement of Niamey was modified in 1968 and was further revised in 1973. In that year Council of Ministers was created to replace the Council of Commissioners and the position of Executive Secretary was established in place of the Administrative Secretary. The 1968 modification ensured that high level officials of the riparian states would participate in the Commission decision-making process, thereby binding more closely those states to Commission decisions. The Commission's formal charge is now "to encourage, promote and coordinate studies and programs concerning the exploitation and development of the resources, including water, of the Niger Basin, for the purpose of ensuring the most effective use of the resources of the Basin."

Over its first ten years, the Commission can boast the following accomplishments: 1) A "Navigation Study of the River Niger between Tossaye and Yeliva" by NEDCO; 2) The summary of a UNDP/FAO study on the integrated development of the Niger Basin in "La Rapport de Synthèse de la Mission Interdisciplinaire"; 3) the creation, staffing and installation of a Niger River Documentation and Analysis Center

1/ Act of Niamey, Article 5.

at Niamey; 4) and the adoption of a resolution entitled "Agreement on the Regulation of Navigation on the River Niger." The NRC has also actively encouraged Canadian-funded barge navigation trials to test the feasibility of river navigation up the river to Niamey. The NRC has caused a computer model to be used in planning for total basin development.

While the NRC has evolved significantly as a regional organization in the past few years, it still has limited technical capacity. Until recently its professional staff consisted of the Executive Secretary (Mr. E.M. Adagbulu); an American transport engineer (Mr. Charles Joyce); two accountants, and a librarian at the Documentation Center.

The Niger River Basin Commission after a number of years of little activity has begun to play a useful role, and it has plans for the expansion of its activities in the future. The first major undertaking will be the completion of a comprehensive indicative plan for the Niger Basin.

(ii) Large Scale Irrigation Projects. The only large scale irrigation projects in the Niger Basin are located in Mali. The oldest of these is the Office du Niger.

The Office du Niger was initiated nearly fifty years ago by the French Colonial Government. The plan was to irrigate a vast area of the Niger delta (500,000 has) to grow cash crops for export to Europe. The Office was an independent organization within the country; it built up a large administrative structure on a scale commensurate with the planned scheme.

Many difficulties were encountered at almost every stage of the process: difficulties in levelling land adequately for irrigation, difficulties in eradicating wild rice from the fields, difficulties in getting enough farmers to work in the area, and difficulties in marketing from such a remote area. By 1960 only 55,000 ha had been irrigated for rice and cotton. At this scale the Office was uneconomic for farmers and for the scheme as a whole. After independence the Office was brought under Malian government control.

Currently, there are about 35,000 people active on the project, plus 2,264 technicians and administrators. Cotton has been abandoned as a major crop though it may be reintroduced later. The area is now devoted to sugar cane and rice. The sugar cane residues support a cattle feed lot. The sugar is run as a state farm and yields are around 60 tons/ha of cane harvested. This aspect appears to be working well.

Problems continue with rice cultivation. Yields are still less than 2 tons/ha and are below economic levels. Techniques are in part a problem as no transplanting is carried out. Fertilizer is

difficult to obtain and not efficiently used. Waterlogging in the wet season and lack of water in the dry season compound the other problems.

Other large scale projects on the Niger include 'Operation Riz' at Mopti (31,000 ha) and other rice projects at Segou (44,500 ha). All projects up to this time have relied on the production of only one crop a year, with non-intensive cultivation methods.

(iii) Small Scale Projects. A number of smaller scale irrigation projects are found in Mali, others in Niger, Upper Volta and Nigeria. The Baguineda scheme in Mali is at the original site of the Office du Niger near Bamako. Only part of the area commanded by the canal is being used. The Haute Vallée area south of Bamako is a large promising area where already small scale pump irrigation is underway. Much further downstream in Mali at Gao the World Bank is sponsoring an irrigation project designed to meet local food needs. In Niger there is a rice and vegetable project near Niamey taken over from the Taiwan government and today financed by the Peoples Republic of China. Three or four small schemes are to be found north of Niamey at Sakoire, Lossa and Fergul. Little information on irrigation in Dahomey or Upper Volta is currently available and there appears to be little activity in Guinea. In Nigeria (which falls outside the CWR region) about 15,000 ha are currently irrigated along the Niger.

(iv) Training. The local people who work in water resource development have been trained in numerous ways. The most senior people have been trained in Europe, mostly in France, as hydrologists and engineers. At the extention Genie Rural level, there are two training schools in the Niger basin. One is a regional school for all francophone countries at Ouagadougou, the Ecole des Ingeneurs de l'Equipment Rurale. This school graduates twenty - five engineers each year. The other is a school at Cambogirse which trains "Techniciens Supérieur Hydraulique", graduating about forty a year.

b) Current Plans and Program Needs for Water Development in the Niger Basin.

This and the succeeding sections will focus particularly on the plans of Mali and Niger. To a lesser extent, we will treat Dahomey, Upper Volta, and Guinea. Nigeria, not being part of the CWR Region, is not discussed in detail.

(i) River Basin Planning. The Niger River Commission Council in February 1974 adopted these resolutions: (1) That studies be undertaken leading to the development of an Indicative Plan for Water Resource Development in the Niger Basin: (2) that a "Stream-flow Simulation Model" be constructed for the Niger River (this Canada has agreed to finance); (3) that a downstream extension be made of the "Flood

Forecasting and Warning System", presently funded by UNDP for Guinea and Mali. It was also announced at that time that FAC would finance a study to "Determine the Cause of the Anomalies in the Flood Regime of the Niger River". This study will deal largely with the huge Niger Delta region in Mali.

In discussions with the President Keita of the NRC, who doubles as Mali's Minister of Commerce and Industry, the DAP team learned that the NRC may sponsor the following additional activities and studies: an FAO project to improve pisciculture along the Niger and pilot irrigation perimeter projects (1000 ha) in zones common to more than one state. Three such projects are foreseen: one in the area shared by Guinea, Mali, Ivory Coast, and Upper Volta; a second in the Niger, Dahomey, and Nigeria area; and a third for Chad, Cameroon, and Nigeria. According to Mr. Keita, the NRC may also sponsor: a project to prevent the pollution of the waters of the Niger, a regional project for solar energy utilization, an inventory of potential dam sites, and the training of the NRC secretariat and project-related personnel and a regional training program.

Of all these proposals, the most important is clearly the development of an Indicative Plan for Water Resource Development in the Niger Basin. The function of this plan would be to provide an NRC-approved conceptual framework and criteria for future courses of action for the NRC and its member states in relation to the conservation, use, and development of the water and complementary resources of the Basin.

Preparation of the Plan will probably involve four major stages: (1) the collection, analysis and synthesis of basic information on the Niger River; (2) based on this, the preparation of various options for the development of the river basin, with the technical consequences of each clearly elaborated; (3) the discussion of the various options by the NRC member states; and (4) NRC approval of a strategy for development of the river basin.

It seems appropriate that the preparation of the Indicative Plan be a multi-donor effort with the participation of IBRD, AFDB, CIDA, and possibly other donors, under the coordination of an international donor agency.

In the past few months these plans have suffered a set back. The Executive Secretary was transferred to another post, the term of one senior advisor has expired, and the Commission is at present only represented by the Documentation Center. This Center is run efficiently but has not solved the problem of its relative isolation from most of the countries in the basin. It appears to be underused.

The first need is for the Commission to regain its momentum. As a start, a new Executive Secretary was assigned in December 1974. With the resumption of a small active Commission in Niamey, there

will be continuing problems of linking its international work with strictly national activities. Ministerial involvement was an important factor in the success of the February 1974 commission meeting. It is possible that this be supplemented by good technical coordination at the planning level.

It seems clear that the preparation of the Indicative Plan will be an important activity of the Niger River Commission. Adoption of the Plan, if carried through methodically as outlined above, will take some years to carry out. Most major national projects must be analyzed in the context of the basin as a whole. It will be important to try to balance the overall planning needs with the real requirements of the national governments to move as rapidly as possible on some river development projects.

As the NRC does its work it will need to establish a much closer liaison with the nation states. AID should help the Commission to develop the Indicative Plan by providing selected long and short term assistance. But even more important, AID should seek to improve the effectiveness of the Commission through support of technical meetings of river basin personnel. Through support of workshop sessions for the dissemination of findings by the Commission, and by helping commission staff work for periods in the water planning bodies of the member states.

In the meantime, AID should immediately begin to support the training of African water resource engineers and technicians who will staff both the NRC and those member country technical offices responsible for planning and managing major and minor irrigation works along the river. This training would take place partly at existing regional training schools at Ouagadougou and Bamako, although limited training in the U.S. should not be excluded. AID assistance might be provided directly to these schools or to the schools via a NRC-coordinated training program. It is anticipated that other donors involved in the development of the Indicative Plan would share in the costs of this expanded training program. Alongside the formal training program, AID should provide a pyramid-type on-the-job training program for water resource planners at various levels. This may take the form of short-term sequential workshops which seek to gradually build up skills and planning capacity.

(ii) National Plans. The incentives for water development are different in each country. In Guinea and Upper Volta, power generation is the most pressing need because in both countries mineral resources can utilise much of the hydro-electric power (A.E.P.) which is to be generated.

Water control for year round regulation of the Niger, permitting two or three crops per year under irrigation, is recognized as

a great development opportunity, both by the governments of Niger and Mali and by donors interested in helping these countries free themselves from problems of drought and periodically inadequate food supplies. Both Niger and Mali are among the least developed countries in the world as measured by GDP. Once internal food supplies are met, their governments will look upon Niger waters as the main means of transforming the agricultural sector and modernising crop production and marketing.

Practically all government contacts made on the DAP mission, regardless of branch or level, emphasized the need and desire to increase food production. Governments appreciate that unless they can master their water they will have difficulty in increasing, diversifying, and stabilizing food production, either for internal or for external markets.

In Niger the government accent is on irrigated agriculture for food crops as an insurance against drought, though the plan is to produce cash crops from irrigation within five years. Irrigation potential is estimated as 20,000 ha for basin irrigation and 25,000 ha terrace land. About 2,500 ha are now under irrigation. For the Nigerian government, 15 - 20,000 ha of well managed irrigated land is the long term goal. This is modest in comparison with Malian objectives but difficult enough given the small part of the main river in Niger and the relatively slow progress with current schemes.

In Mali the number of rice cultivation projects under way involve large areas of land at Mopti and Segou but do not involve large capital works. Feed canals are constructed from the main river. Flood water is led through these canals to the irrigable land. Some drainage and distribution canals form part of the system, which aims at one rice crop a year. Much opportunity exists for increasing rice production by using this kind of mechanism. But to realize the long term development potentials will require storage and river regulation. The Selingue Dam is one such river regulation project which is at an advanced stage of assessment. The World Bank commented in 1973 that the economics of this Dam would depend on irrigation possibilities. Already UNDP teams are well advanced in a study of the physical resources of irrigable land. (See Table I)

Two other projects are in operation at present but could be considerably expanded.

The Baguineda Project down river from Bamako offers a most interesting potential for AID input. This is an old project which was started in 1928 by diverting water from the Niger River into a 44 kilometer canal. This canal was designed to serve more than 33,000 hectares on the right bank of the river. Some 3,000 hectares more were planned for irrigation on the left bank.

TABLE I.

SELINGUE DAM.

Reservoir size:	2 billion m^3
Objectives:	1. increase low flow of Niger to 200 m^3/sec
	2. energy output with 4 turbines @ 11,200 kw each
	3. agriculture 55,000 ha irrigated
	4. navigation - Koulikoro - Markala all year
Cost Estimates: 1972.	32 billion Malian Francs ($64 m.) of which
	Agriculture 1/3
	Dam 2/3
Costs now probably	$100 mt.
Financing by:	FED, FAC, German, Italian, UNDP consortium
Timing:	Begin work 1975
	Finish 1979/80
Data translated from:	Mali 1972/73 Dossier d'information
	Published March, 1974

At the present time there is production on only about 3,300 hectares. The main canal and distribution system has deteriorated over the years. Substantial repair and maintenance will be needed if full development of the area is to be realized. Tomatoes have been successfully grown at this location, and a new tomato processing plant is scheduled to be built here in the near future.

FAC continues to provide limited technical and financial support to Baguineda under a five-year commitment. Any program of USAID would need to be coordinated with the FAC program so that no conflict would occur in the use of the main canal and conveyance works. While more thorough examination and study would be necessary before committing U.S. funds to this project, there are several features which make it an attractive project to consider.

While the main canal and some of the physical works are at Baguineda in need of rehabilitation, there is considerable capacity to begin a modest sized irrigation development immediately. Thus, no early expense in major facilities would be necessary. Tracts could be selected which have been levelled, which contain good soils, and which have the basic distribution channels in place. Thus, the start-up costs could be very low. The size of the project could be scaled to whatever size best suited the purposes. There would be good opportunity for expansion. AID should consider starting small and expanding as appropriate. This makes special sense if we accept as important objectives the training and establishing of farmers on the land.

The Baguineda Project could serve as a demonstration area for different methods of irrigation and crop varieties. It could be expanded to contribute in a very significant way to the food requirements of Mali. Being close to the capital city of Bamako, there should be a ready market for the products grown. The project would offer a good opportunity to improve the economic and social welfare of the farmers presently living in the area, rather than constituting a major resettlement operation. Baguineda also offers an excellent laboratory to try out various training techniques and social programs. The area is also ideally suited for livestock raising, so that mixed farming and animal traction could be made a part of the program. Located near Bamako, the logistics of transportation and communication would be minimized.

The operation Haute Vallée is another agricultural project involving small farmers in the upper vallies of the Niger Basin. The area is normally within easy reach of Bamako (though the roads are poor and often impassable in the wet season) and Bamako is Mali's most important market for agricultural produce.

The total area of the Haute Vallée plainlands is about 151,000 hectares (377,500 acres) and the active population of the zone is 65,000, or about 6,000 families. As an "operation", Haute Vallée is

a target area for modernisation and receives coordinated government extension services.

Although the area is large, the project is essentially geared to the development of small scale farming and to the improvement of techniques involving simple technology. The only kind of irrigation practiced at present is the simple diversion of stream run-off during the rainy season and the use of the flood-waters of the River Niger when the flood is sufficiently high. There is no regulation of the river; there are no reservoirs and pumping stations.

Mali's Ministry of Production offers financing to enable farmers in the area to purchase diesel motor pumps to operate small wells. The pumps are commonly four or six horse power. A few of the farmers have thus already had experience in irrigating specialty crops and have proven to their own satisfaction that this can be very profitable. There appears to be excellent rapport between the extension people and the farmers. There also appears to be a good working pattern of providing credit, seeds, fertilizers, and so forth to encourage irrigated farming.

An AID program in Haute Vallée could capitalize on that area's peculiar physical situation conducive to small farm irrigation schemes. This, together with the positive attitude and background of the extension workers, would ensure a high probability of success. AID assistance could be in the form of pumps and power units, well drilling, irrigation equipment, assistance in irrigation design and operation, technical assistance and training to extension cadre, and training and assistance in the operation and maintenance of small pumping plants and power units, to name just a few.

c) Program Conclusions.

Niger River basin development involves the creation of new resources. Involvement in this sector should be seen as part of an inter-locking strategy to assist the countries concerned. AID is unlikely to be a major donor but has an important part to play. The role AID chooses to play will be determined largely by a combination of three factors: the needs of the countries concerned, the assistance available from other donors, and the fiscal, technical, and philosophical framework of US assistance.

The overall goal of assistance in river basin development in the Niger basin should be to provide a basis for future long-run economic and social growth through water resource utilization. This can be achieved through a variety of training and production projects; but the aim will be to link activities in such a way that ready evaluation and feed back is a functional part of the operation.

At river basin level AID involvement should include: (1) assistance in the design of an effective commission communication system with the national governments; (2) limited technical assistance in the preparation of an Indicative Plan, including advice on the nature of the planning process to be used; (3) limited technical assistance to the commission and, if needed, in training within the commission.

At national level AID involvement should include:

(i) Assistance with between one and five small water-use projects in each of the countries. Where possible these projects should be linked regionally or in some other way, with other U.S. activities in the area. Project design should be considered carefully. There is a strong case to be made for the view that in the Niger basin, the shortage of irrigators is the most important constraint to the development of efficient irrigated agriculture. But in addition, despite current food deficits, it is likely that marketing, both internal and for export, is another major bottleneck which will need to be addressed separately.

(ii) The use of these schemes as training projects, at farmer and extension worker level. Perhaps the Peace Corps may become involved in such work.

(iii) Project design, so that around the support of these schemes AID can provide a flexible allocation that will allow the exploration and response to ancillary needs, especially for markets and marketing, perhaps even including minimum transport means to market. The schemes will also allow AID to help build up local management capacity in marketing.

(iv) At government level, assistance in the development of a planning-water resource evaluation capacity. In Mali this might involve, for example, a team linking the Hydraulics Division, Génie Rural, and Production. Assistance might include short term technical and planning help and funds for release time for key people.

(v) Assistance with the development of middle level management capacity through problem-focused field seminars and workshops. In so doing, AID should help set up a pyramid training program linking central planning evaluators, middle level personnel, and farm level extension workers.

(vi) While much of AID's emphasis should be on short term, on-the-job training, support should be considered for the schools for engineers. AID's particular goal should be to write more practical components into the curriculum. AID should continue to encourage the use of C.I.E.H. (Interstate Water Commission) staff in training programs and should also seek ways to inject longer range issues and river basin perspectives into training programs.

(vii) Although much can be learned through practical experimentation, there are many areas where specific studies would supplement project activities. These include:

-- Farm level studies of incentives and of economic crop mixes

-- Farm level and project level studies of water use projects

-- The evolving market structures within the countries, including the evolution of new markets in growing urban areas

-- Cost benefits of different kinds of water use

-- The regional needs of water use development and the special regional constraints

-- Possible patterns of future use of the Mali inland delta

-- Environmental side effects of water-related development projects

-- Continued support to strengthen the C.I.E.H. as a regional information center for water resource development. Expression of the Center's functions to include planning and evaluative skills for water resource development programs and projects (large and small scale including small dams, bas-fonds development, dallol development, etc.)

In the Niger basin it is quite likely that other donors will go ahead with some major water development projects. In this case it is important that the U.S. develop a program to build up expertise and experience in water use in order that the countries and farmers can reap the benefits of these projects. Experimentation is a necessary part of this process. Such experimentation should be achieved through a series of small scale projects in which water control, land preparation, farmer incentives and marketing infrastructure are linked. Every water development project currently underway should be regarded as an experiment. But at present there are almost no structures of personnel within the local governments which can properly deal with the interrelated issues involved.

At the farmer level AID thus can help by supporting small scale projects and by building in a capacity to evaluate these projects as training experiences. At the government level, AID can help by

assisting in the creation of evaluation and feed-back mechanisms. Finally, AID needs to help at the middle levels by creating managerial and planning expertise. This may best be carried out by linking on-site professional training with local seminars and workshops.

If in the next five years AID can move in these three areas, linking personnel training with the creation of water use experience, AID will have contributed to building a base on which to build a new pattern of water resource use.

4. Lake Chad Basin

Although Lake Chad itself is usually the focus of attention from development planners in Africa and within external donor agencies, it is the Lake Chad Basin which establishes the physical and ecological boundaries of this major water resource. In considering development alternatives and strategies, it is vital to remember that part of this resource is available in stream flow form from rivers in Nigeria, Cameroon, Chad, and the Central African Republic; part is available as underground resources in a roughly circular area a thousand miles in diameter and involving seven states, Nigeria, Niger, Algeria, Cameroon, Chad, the CAR, and the Sudan; and a part of this resource is available in the Lake itself.

Believing that a coordinated exploitation of land, water and plant resources, market and transport development, and joint research were required for the maximum utilization of the Lake, the four lake side states, Nigeria, Niger, Cameroon, and Chad, established a regional commission in May 1964. The Lake Chad Basin Commission was given the responsibility of coordinating research activities, evaluating projects prepared by member states, recommending surveys and projects, and maintaining liaison among member states in regard to regulations affecting the Lake. The responsibility of the Commission was limited to an area of 427,300 square kilometers known as the "convention basin". (The Lake itself fluctuates in surface area from under 10,000 square kilometers to over 25,000 square kilometers.) The following table indicates the relative distribution of the Lake, the geographical Chad Basin, and the conventional Chad Basin.

Country	Geographical Basin	Convention Basin	Lake Area
Cameroon	51,200	37,500	1,600
Chad	1,165,530	178,300	10,000
Niger	679,840	121,500	3,400
Nigeria	186,560	90,000	5,000
Algeria	92,400		
CAR	207,200		
Sudan	68,640		
	2,451,370 km^2	427,300 km^2	20,000 km^2

In spite of severe environmental constraints on development posed by its landlocked position and distance from population centers, development of these water resources could catalyze overall economic development based on agriculture. Development of these water resources in an ad hoc fashion risks upsetting the delicate ecology of the region, destroying the fishery resources of the delta and the lake, creating

waterlogged and saline land around the Lake, and encouraging livestock concentrations in areas most susceptible to desertification.

The Lake Chad Basin Commission, assisted by member countries and United Nations organizations as well as other donors, is undertaking geological studies, surface and underground water studies, research in using irrigation for crops useful for human and animal consumption, road needs and fisheries. The Commission must rely largely on outside technical and financial aid to carry out these responsibilities. The Commission views itself as an agent of the four member states charged primarily with the duty of coordinating basic resource studies which may then be the basis of national action plans. In some instances, however, the Commission has also been designated as the action agent to carry-out specific plans and projects.

The U.S. has therefore developed a dual strategy for working with the Commission and its member states on projects related to the Basin's natural resources. For activities involving research, evaluation and planning, the Commission is the preferred funding vehicle and focus of management. This would consist of the on-going pilot livestock program in the Assale-Serbewel area and the development of the proposed water resource systems model for the Basin. For production projects and for those micro-experimental projects closely linked to national development programs, such as the Lake Chad Irrigation Project in Chad, the U.S. would participate directly with the national government which would be responsible for coordination with the Commission.

The annex attached to the Chad country chapter (Section III) provides a brief summary of the physical characteristics of the Basin and its development problems and opportunities. The first step in developing a strategy for addressing these problems is to conduct the water resources planning study being developed by Meta Systems. It is recommended that expanded training fields related to water resource development and management be an integral part of the study. Further specific program recommendations would be submitted following the completion of the study. There are, however, a number of micro-studies (e.g., the Polder Development Study) being undertaken in Chad, which can and should proceed prior to the completion of a comprehensive study. These micro-investments have been carefully reviewed to assure that there will be no adverse environmental impact and will provide necessary agronomic data and management experience for later, more expanded programs.

B. The Entente Fund

1. History of the Fund

On June 9, 1966, just after Togo joined the Council of the Entente, the five Entente states (Ivory Coast, Upper Volta, Niger, Togo, Dahomey) signed a Convention creating the Mutual Aid and Loan Guaranty Fund of the Council of the Entente (the Entente Guarantee Fund) to replace the Entente Solidarity Fund. The purpose of the Guarantee Fund is to guarantee "productive loans from outside the Entente States, issued or contracted for by the states, public or semi-public institutions, or private enterprises having their registered office and main field of activity in one or more of the member states..."*

It soon became apparent, however, that this guarantee function would not be sufficient to trigger the necessary degree of economic development if not accompanied by strenuous efforts at the Entente level to promote a common economic policy among the member states. Thus, the Fund began to conceive of its role as being more a catalyst of economic and social coordination in the Entente area. This it was to do by stimulating the creation and development of complex inter-state operations within the planning frameworks adopted by the states themselves. To this end the Fund has been primarily involved in promoting regional infrastructural projects, especially in the fields of road transport, livestock, grain production and stabilization, telecommunications, and tourism. The Fund has also been involved in the creation of at least one regional technical organization (the Entente Meat and Livestock Community). Since 1968, the Fund has administered a modest development budget to finance studies of promising projects by outside consultants, studies which hopefully might induce donor organizations to fund the subject projects.

The Administrative Secretariat, located in Abidjan, is the principal administrative and coordinating organ of the Entente Council. The Secretariat operates under the general policy guidance of the Entente heads of State who, in principle, meet at least twice a year to frame the general policies of the organization. The Secretariat has considerable influence on the entire decision-making process of the Entente Council by preparing the dossiers to be considered by the Chiefs of State. The staff of the Secretariat includes the Administrative Secretary and his technical advisors (finance, agronomy, engineering, fiscal management). The latter group is funded under technical assistance agreements with the U.S. and France.

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*Article II of the Convention

2. The Entente Livestock Community (ELC)

In 1966 the Entente states asked SEDES (a French semi-public research organization) to inventory the livestock situation in the region, and to recommend measures to be taken in common to alleviate an eventual deficit in production. A second study, undertaken in 1968, discussed fiscal legislation and the regulation of categories of professionals believed necessary for implementing a harmonized strategy of production and trade in livestock and meat between the two primary producing states (Niger and Upper Volta) and the three consuming states (Ivory Coast, Togo, Dahomey). An inventory of national and multinational investment projects was drawn up which aimed at increasing both the productivity of herds and facilitating the movement of livestock on the hoof and the trade in meat.

In March 1970 the Entente states created the Entente Livestock and Meat Community (ELC), with headquarters at Ouagadougou. The ELC was charged with the promotion, in a regional framework, of the production and commercialization of livestock and meat. As a further stimulus to the regional coordination of livestock sector activities among the Entente states, AID provided the ELC in 1971 a $6.0 M livestock sector loan to be used to fund ELC-approved projects in the member states. Prior to the disbursement of funds for the second tranche of the loan, AID required the Entente states to sign a series of protocols facilitating livestock production and trade among the five countries. The protocols were to establish agreement upon 1) the harmonization of statistics and data collection measures; 2) the licensing of professionals and merchants (butchers, etc.); 3) the gradual reduction of customs duties in livestock and meat between states; 4) pricing; and 5) sanitary (health) regulations.

AID and FAC provided technical personnel to staff the ELC in order to negotiate and implement the protocols, to review and approve projects to be funded under the AID loan, and to formulate and promote a regional livestock policy. This ambitious program has encountered numerous difficulties. Negotiation and implementation of the protocols has been fitful. The relatively simple protocols (statistics, professional licensing, sanitary regulations) have been signed, but are surprisingly difficult to implement. Their long-term value as part of a regional livestock policy is therefore marginal. The customs protocol, meanwhile, was signed only recently when Upper Volta was finally persuaded to lower its export tax on livestock and meat. The pricing protocol was not signed at all and AID has waived this as a condition precedent to the disbursement of loan funds. Little progress can be expected towards establishing a coordinated price policy by the Entente states. The stumbling block here is the importance of Ghana and Nigeria as alternate markets for beef. A coordinated price policy would greatly complicate cattle shipments from Mali and Chad to the coastal states.

Several problems, including lack of progress in signing the specified protocols, slowed the disbursement of AID loan funds. The ELC took a passive role in the identification and formulation of projects for loan funding. Projects submitted by member states were often sent back for additional design and then floundered, owing both to government inaction or disinterest and to the absence of ELC assistance in improving the project dossiers. The Sahelian countries by and large have avoided use of the AID/ELC loan funds and have obtained grant funds elsewhere to implement their priority livestock projects. With the exception of a single project in Niger, only the Ivory Coast and Dahomey have benefitted from project sub-loans, although often only after lengthy and confusing delays over project design (Cotonou Slaughterhouse, Akpara Ranch). Finally, the value of even the projects which have been funded is questionable within the context of promoting a regional livestock policy. Most of the projects funded under the loan have not been genuinely regional projects, rather they have been national projects which may be considered regional only if one applies the widest meaning of that term.

As the ELC Director, Mr. Tall, freely admits, the promotion of a regional livestock program at this time is very difficult. The ELC, and apparently the Entente Fund, feel it is not politic for the ELC to play a major role in forming national livestock policy -- even that part of livestock policy which has important regional implications.

Further, the ELC recognizes the difficulties of promoting a regional program in which several key states of the region (Ghana, Nigeria, Mali) do not participate. Recently the West African Economic Community (CEAO) composed of Senegal, Mauritania, Mali, Ivory Coast, Upper Volta and Niger was created with headquarters at Ouagadougou. The CEAO also plans to establish a Livestock Commission.*

Eventually the ELC and the CEAO Livestock Commission may merge, with Mali representing the linch-pin between the two groups of states. Apparently fearing that political difficulties will slow such a merger at the Chief-of-State level, ELC technicians have themselves proposed that it take place immediately. Such a union, however, would still have no influence on the livestock policies of West Africa's largest consumer of beef - Nigeria - which imports large quantities of beef from Niger, Upper Volta and Mali. Nor would the merger influence Ghana, a smaller but still important market for beef from the interior Entente countries.

3. Future Livestock Policy

The Entente Fund (EF) and the Entente Livestock Community (ELC) have constituted the primary mechanisms which AID has used to influence livestock policy in the Entente states. AID support to the EF

*The CEAO regional livestock policy was reportedly formulated by the ELC.

and ELC was timely and imaginative, but probably over-optimistic. This form of support enabled AID to provide assistance with relative administrative ease to five countries at a time when strict country limitations existed on bilateral assistance.

But major changes have recently taken place which affect future AID planning in important ways. Due to the drought, AID now provides bilateral assistance to the Sahelian states of Niger and Upper Volta. At the same time, the promise of the meaningful regional integration of livestock policies has faded considerably. AID now has three basic options regarding continued livestock assistance to the Entente Fund and the ELC: a) to maintain the present level of support to the ELC, continuing to use the ELC as AID's major instrument for affecting livestock policy in the region; b) to diversify AID's livestock strategy by increasing bilateral assistance to the Sahelian states, while providing relatively large scale, yet more narrowly focused, assistance through the Entente; or c) to terminate assistance through the Entente mechanism and provide bilateral assistance to all or most member states.

Two major factors were considered in selecting a preference: a) the degree to which AID's assistance might influence policy (regional and/or national), and thereby increase the capacity of the livestock sector in these countries and in the region as a whole; b) the administrative burden each option places on AID.

AID strategy in the Entente Livestock Project (One) tried to encourage the establishment of a regional livestock policy and the development of corollary projects. However, as seen above, difficulties in obtaining agreement on the more significant protocols and in finding projects which have a truly regional impact have tempered AID optimism toward this objective. Nevertheless AID should not totally abandon its support for the ELC and its objectives. There are several regional functions which the ELC can legitimately deal with and which are worthy of continued AID support.

First, having required the signature of regional protocols as conditions precedent for the Entente Livestock loan, AID should selectively support ELC actions that would implement the most important of these protocols. The ELC also can carry out an important regional training function, especially as a coordinating mechanism for short-term training courses and seminars in topics of common interest to member states. The ELC might also serve as a focus for the selection of candidates for long-term training, although this would appear to serve AID's administrative interests more than it would benefit any substantive function of the ELC. Finally, the ELC might play a major role in promoting livestock research within the region. It seems clear that the Entente Fund and the ELC have not and will not play a major role in shaping national livestock policy in member countries. While the ELC might in the future participate more fully with member states in

redesigning and implementing projects submitted to the EF, it is highly unlikely that it would have as much influence on government actions as an equal level of bilateral livestock assistance would have.

We therefore recommend that AID provide bilateral assistance to those Sahelian countries of the Entente (Upper Volta, Niger) in which livestock is a very critical element of any national development program and in which major AID resources will be concentrated. At the same time, AID can play a role in the livestock sectors of the coastal states and can continue to support regional objectives by providing additional loan assistance through the Entente structure. Although all Entente countries should be eligible to benefit from additional loan assistance provided through the Entente structure, it is unlikely that the Sahelian countries will call upon these funds unless the grant assistance provided by other donors to the livestock sector falls off significantly.

Rather than continuing to fund any feasible national project indiscriminantly, however, AID should consider establishing criteria which tie ELC loan funds more tightly to projects which clearly have regional benefits and facilitate the supply of beef from the poorer Sahelian states to the coast markets. These projects would deal primarily with the marketing and transport sub-sector, assuming that Sahelian countries would not request loan assistance for livestock production projects. Projects which facilitate livestock production in the coastal states (thereby decreasing aggregate demand for livestock from the Sahelian states) should be considered only: a) if they deal with the production of livestock (cattle, sheep, goats, pigs, chickens) which clearly cannot be supplied by the Sahelian countires in sufficient quantity to meet market demand over the medium-term; and b) if they are located in relatively disadvantaged regions of the coastal states (the northern districts) and primarily benefit the low-income groups of those regions.

4. Grain Stabilization and Marketing

For some time prior to the drought, AID had been concerned over the growing cereal deficits in West Africa and the continuing need of PL 480 assistance. AID's approach to the matter took several turns before program funding was approved. In 1969 Weitz-Hettelsater Engineers completed an AID-funded study which sketched a grain stabilization plan for the Entente States and Ghana. Their far-reaching recommendations were not fully accepted by the affected countries and a second study, by Checchi and Company, limited itself to two Entente States (Niger and Upper Volta) and to two OMVS (then, OERS) states (Mali and Senegal). Conversations among AID, the Entente Fund, the OERS and interested governments followed this study and led to the establishment of certain general principles for AID assistance in the grain stabilization sphere. Kansas State University then prepared a detailed grain stabilization and

marketing program for Senegal, Mali and Upper Volta while CIDA consultants did the same for Niger.

From this process, two AID projects emerged under the auspices of the two regional organizations. In conjunction with CIDA and FAC, AID approved in 1972 major capital, technical, and PL 480 assistance, a $1.8 million loan for construction of warehouse and office facilities and grant assistance for technical assistance, training, and equipment. AID's purpose was to assist the national cereals offices which had been established in Niger and Upper Volta. A regional cereals office was also set up under the Entente Fund to coordinate planning between the national cereal offices, and to collect and analyze information to help formulate policy and to assist in the planning of market campaigns. An AID funded technical advisor (Mr. Pattinson) presently works out of this office.

Due in part to the drought, the grain stabilization and marketing programs in Niger and Upper Volta have operated with only marginal success.* Since then programs have been wholly national, linked through the Entente for management and administrative convenience (project management, provision of technical assistance to both countries) rather than because of any overriding regional linkage between the programs.

The DAP team recommendations for the program are found in the bilateral conclusions and supported in the Niger and Upper Volta agriculture sector analyses. The continued funneling of AID assistance through the Entente Fund for these national programs should be a function of how (and if) AID decides to assist the national programs in the future. Given AID experience in the Entente and OERS grain stabilization programs, and given poor results from similar programs in several other LDCS, AID and the EF should no longer consider expanding their grain stabilization efforts in the Entente countries until such time as national marketing policies support the effective structuring of workable stabilization programs.

5. Food Crop Production

In recent discussions with AID, Entente Fund officials have proposed the extension of EF/AID activities into the agricultural production sub-sector. At a November, 1974 meeting between EF and AID representatives in Abidjan, the agricultural service chiefs of the Entente countries indicated they would welcome an AID loan through the Entente Fund which would finance sub-projects in their countries. While the project as originally conceived would deal only with cereal production,

*The grain stabilization and marketing programs in the OERS states (Senegal and Mali) also operated poorly. AID assistance to these programs was terminated in 1973.

the agricultural service chiefs proposed that tuberculox and tree crop projects should also be eligible for financing. Unlike the Entente/AID livestock program, there is no indication that the proposed program would deal specifically with regional problems or that it would attempt to encourage a regional crop production or marketing policy. Trade in agricultural produce among the Entente states is relatively unimportant especially when compared to their trade in livestock. The program would be useful primarily as a vehicle for channeling AID assistance to the coastal states of the Entente where bilateral grant assistance is presently precluded by AID policy.*

AID and the Entente Fund should, however, set specific parameters for sub-project financing. Limiting loan funds to dealing with certain key problems of crop production common to the coastal states, for example, would encourage governments to identify and design projects to deal with those problems. Such a criteria would also enable the EF to direct its in-house project review capacity to specific problem areas, thus enabling the Fund to build up expertise in these areas over the life of the program. Examples of priority problem areas which are common to the coastal states (and in many cases to the Sahelian states) include on-farm storage, seed multiplication, crop protection, fertilizer utilization, animal traction, and manufacture/distribution of agricultural equipment. Some of these problems might be dealt with on a multi-country basis (e.g. seed multiplication in Togo and Dahomey) and program guidelines should encourage these economies of scale. Finally, AID should ensure that sub-projects funded under the loan provide major direct benefits to AID's target group - the poor majority (generally small farmers) in the participating states.

A major constraint to rapid loan disbursement may be the Entente Fund's limited technical staff. AID should consider complementing a food crop production loan with a small technical assistance grant to the EF which would provide a long-term advisor to help manage the program and funds for short-term American specialists to help design or assess sub-projects. Short term and degree training necessary to ensure the success of the sub-projects might also be funded under the grant project.

If the initial agriculture production loan proves successful, additional AID loans in this important sub-sector should be considered.

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*As in the Entente livestock loan, it is assumed that grant financing from other donors will be available in sufficient quantities to fund agriculture production projects in the Sahelian states (Niger and Upper Volta), although they would be eligible to receive sub-loans under this program if they so desired.

6. Agriculture Credit

Entente Fund leadership has also recently proposed that AID channel an agriculture credit loan to Entente member states via the Fund. Unfortunately, EF officials did not discuss this subject with the DAP team and the objectives of the proposed EF program are as yet unknown. Based on DAP team analysis of agriculture credit problems in the Entente states, AID should consider using bilateral rather than regional programs in the credit area. As indicated in other sections of this document, problems associated with the provision of agriculture credit vary in important ways among Entente nations. These problems cannot be affected in a meaningful way through the mere provision of additional capital funds. The problems of supplying credit to small farmers are fraught with complex policy issues which would most likely require lengthy study. Such issues would certainly involve delicate negotiations between host country and donor if major changes in policy are to occur. In other EF/AID programs (e.g., the livestock loan), the EF has chosen not to play a forceful role in suggesting policy modifications to member states. Since agriculture credit is clearly a national rather than a regional problem area in any case, it would be most unlikely that the EF would be willing to play a more assertive role in requiring the modifications of national agriculture credit policy. Further, should the EF even find the will to deal with such domestic issues, the Fund would not have the capacity to do so simultaneously within the five Entente countries.

We recommend that AID deal with general agricultural credit through bilateral programs rather than through the mechanism of the Entente Fund except where credit is an important component of livestock or food crop production programs.

7. Promotion of African Enterprise

Stimulated in part by a 1968 OCAM resolution which called for "a dynamic policy of Africanization of staffs of existing enterprises and the promotion of new African enterprises", the EF in 1969 asked AID to finance a study on the feasibility of a regional program to encourage African entrepreneurs in the Entente countries. This and other studies eventually led to a $7.5 million AID loan to the EF, passed to national development banks in the member countries. The objectives of the loan and the AID technical assistance grant which complements it are: a) to encourage a substantial expansion of economic activity carried out by African entrepreneurs in the Entente countries; b) to strengthen development banks as institutions capable of taking a more dynamic part in national and regional development; c) to mobilize private capital for production investment uses; d) to expand the role played by the EF in regional economic development; and e) to strengthen national institutions (such as industrial and small enterprise promotion centers) which are concerned with project identification and preparation, training, and other technical assistance for the entrepreneur.

The AID loan has been disbursed quite rapidly and the EF and member states have requested additional assistance through a second loan. Since a major evaluation of the Entente Enterprise program is already scheduled to take place prior to the final design of a second loan, the DAP team will limit itself to the following comments.

There appears to be a critical shortage of low-interest, medium term credit for small and medium sized African entrepreneurs in all of the Entente states (although to varying degrees). AID capital assistance can obviously serve only a minimal portion of demand for such credit. AID funds should thus be used to demonstrate to national development banks the utility of re-structuring credit policies to deal with this sector of their economies in a more adequate fashion. Thus, the evaluation design effort mentioned above should attempt to assess the degree to which national development bank credit policies have been modified as a result of experience gained through the first AID loan, and the degree to which a second loan would stimulate further "institutionalization" of credit policies which assist small and medium African enterprises.

AID should study the apparent need of the development banks for general financial advice in restructuring their credit policies to better meet the development needs of the country. AID capital assistance in this area should be limited, and additional capital assistance (beyond a second loan) should not be needed to further prove the validity of these objectives. To facilitate the "institutionalization" process, AID funds might be more tightly integrated into the loan portfolio of the participating banks (e.g., consideration of credit packages using AID funds in conjunction with other credit, such as loans for short-term working capital buildings, and the like.* AID funds for these purposes should not be managed by expatriate advisors who operate almost independently of bank management. To assist this integration and to achieve monetary leverage with AID resources, a guarantee fund for African entrepreneurs for buildings, working capital and commercial bank credit at market interest rates could be productive, inexpensive and non-distorting. While guarantee funds exist in some Entente countries, there is little evidence that they reach those people which the AID loan is trying to help.

Finally, we recommend that AID in cooperation with other donors study the effectiveness, costs, and politics of existing promotion centers. AID should consider assisting the reinforcement of existing promotion centers, using African consulting services such as SAED in Upper Volta, where possible. AID should also consider assisting the establishment of new centers in Dahomey and Niger. Eligibility for subloans should be more strictly limited to firms with majority African

*There is evidence that in some cases, AID funds were used for short-team working capital where sufficient credit for such purposes already existed.

equity. AID funded projects should enjoin broader African participation in the commercial and industrial structures of the Entente States.

8. Transportation

The Entente Chiefs of State established in 1970 a High Committee of Land Transport. This Committee has concerned itself with measures which would facilitate increased traffic between the Entente countries. These measures include customs conventions on international road transport, the harmonization of road accident insurance, and regional spare part management. National support for Committee proposals has been limited, but some progress has occurred. For example, a recent agreement between Togo and Upper Volta will encourage road transport between the two countries and will increase the utilization of new port facilities at Lome. Meanwhile, CIDA has agreed to undertake studies required to prepare a regional transport plan for the Entente states. The area covered will also encompass Ghana and, to a lesser extent, Nigeria and Mali. Finally, the Entente has managed the Regional Road Maintenance and Training Center (CERFER) at Lome, Togo, since 1969.

Congressional legislative action would seem to limit major AID capital participation in most regional road construction projects. Yet, as pointed out in the transport sections of this paper, there are important efficiencies of scale that can be realized if transport planning activities are carried out within a regional context. The crucial factor to notice is the degree to which national governments allow national transport decisions to be influenced by regional considerations. AID should encourage Entente-related transport institutions to the extent that they are supported and used by member states. Thus, AID should continue support to CERFER, bearing in mind AID's long term involvement in the Center and the need to gradually transfer financial and managerial responsibility for the Center to the Africans. Also, should the CIDA regional transport study lead to the creation, among other things, of an organization within the EF akin to the transport institute described in the transport section of this document, AID should consider complementing other donor technical assistance, if needed, in an effort to get the organization off the ground.

9. Future AID Assistance to the Entente Fund - Summary

AID assistance to the Entente Fund has followed two general strategies. First, through the Fund, AID assistance has encouraged the development of regional programs among the Entente states which deal with problems that require regional coordination and interrelated development (e.g., the Entente Livestock program). Second, AID has supported the Entente Fund as a regional vehicle for channeling AID monies to the five member states to deal with national problems which, while common to many or all of the member states to a greater or lesser extent, do not all

have major regional implications (e.g., African enterprises, agricultural production). Also through the Entente Fund, AID has channeled funds to regional institutions which provide services to the member states. (e.g., The Regional Road Maintenance Center).

As noted above, in order to avoid confusion in program design and evaluation, AID and the EF should clearly determine at the time of project identification into which of these three categories the institution, or project, assisted is intended to fall.

The amount of AID financing which could be channeled through the EF to its member states is conditioned: a) by the capacity of the EF to identify, design and effectively manage AID funded development projects; and b) by member country interest in receiving donor assistance through the Entente structure. The latter constraint involves the perceived trade-offs between bilateral and regional assistance programs, and member governments' interest in supporting the general objectives of the Entente within the context of their macro-political policies and alternative regional groupings (e.g. ECOWAS, CEAO).

To date the Entente Fund's small staff has demonstrated an adequate capacity for the identification and management of a limited number of AID projects, although management has been less adequate for the more ambitious and complex Entente Livestock programs. Project design to date has largely been carried out by AID staffers or contract personnel with limited EF assistance. EF administrative capacity will become a more serious problem if the Fund involves itself in additional AID funded projects, especially those which have complex regional program objectives. Also projects which the EF administers as a regional vehicle (e.g. national agricultural production), in the absence of a technical institution such as the Entente Livestock Community, will require a substantial EF contribution of time and technical skill if proposed sub-projects are to be properly assessed and implemented. AID will probably have to assist the EF in carrying out these tasks through grant assistance (long and short-term advisors) which is made complementary to loan programs.

A more serious constraint is the limited degree to which the countries presently associated with the Entente Fund appear willing to continue to accept donor assistance provided through the EF when they could benefit from direct bilateral assistance instead. These countries clearly perceive a trade-off between direct bilaterial AID assistance and regional AID assistance via the EF; not surprisingly, they strongly prefer the former. This preference clearly exists despite the fact that bilateral AID projects would be likely to entail more complex conditions precedent and a greater degree of AID influence on national policy determinations.

On a broader plane, regional political alliances in West Africa are currently in a period of flux. Over twelve years have now passed since the Entente was formed. Now under new leadership, several members of the organization are re-assessing their linkages to the Entente. Dahomey's new political orientation certainly conflicts with the conservative orientation of Entente Leadership and may lead to Dahomey's effective or de facto departure from the organization. Both Niger and Togo have recently strengthened economic ties with their powerful neighbor, Nigeria, and reportedly are considering participation in the new regional organization sponsored by Nigeria (ECOWAS). AID must therefore review its continued or increased assistance to these states through the Entente Fund with these political implications clearly in mind.

C. Education and Human Resources (Regional Programs)

The country-by-country assessments performed by the DAP teams in October - November, 1974 revealed in the education sector two general problems which are shared by virtually every country in the CWR region.

First, the formal systems are costly and ill-adapted to basic needs. In many CWR countries, the school system itself may be said to constitute a serious liability for development.

But second, in the course of correcting this primary problem, virtually every government appears in danger of substantially increasing the cost of education without proportionally improving the results. Throughout the CWR region, reforms of the formal system are decreed, but not adequately prepared and tested. The various non-formal education programs, designed to reinforce the school system in the rural areas, are often well prepared, but they are too often ill-executed and ill-coordinated, and they are rarely evaluated.

The second problem, then, grows out of the first: that the persons responsible for the reform and reinforcement of the school systems are most often the products of those same systems. Without some fresh perspective, CWR governments may be on their way toward compounding the very problem they have set out to alleviate.

There are two types of regional activities which may serve in the longer term to reduce the serious nature of both these situations. The first type is training; the second is facilitating communication throughout the CWR region among those persons engaged in formulating truly functional education systems.

1. Regional Training

Addressing these problems within the present sector of concentration, training organized on a regional basis is most appropriate for two categories of personnel:

a) Given the urban, civil service orientation of the education systems, management personnel for rural projects and programs are critically needed throughout the CWR area at national, regional, and local levels. Without host-country personnel who are trained in project design, project management, and formative evaluation, AID-funded projects in the region have little hope of success in their own right, let alone a chance for successful replication. The same holds true for development programs funded from whatever source: the demand for trained management is great from host governments (central and local), cooperatives, development societies, and private enterprise alike.

b) Given the demanding nature of the reform and reinforcement in rural areas of the formal school systems, personnel responsible for education and training programs of all types could benefit decisively from training of a comprehensive nature, to start from general precepts of the development process, but to concentrate upon the specific techniques of manpower assessment in particular disciplines; the preliminary research and design of education and training programs; education finance and accounting; and evaluation (including tracer studies). This training should be made available not only to personnel in Ministries of Education, but also to select officials in National Planning offices, non-formal education programs (including functional literacy), and other extension-type programs (agriculture, health, and social affairs).

This training should have as its prime objective not only the teaching of professional skills, but also the imparting of the perspective of a unified functional education system. Such a system would be comprehensive, ordering all public channels of communication from radio to primary schools; and such a system would be functional, keying whatever is taught and transmitted to set objectives, whether they be set in terms of development projects, of ministerial programs, or by informal groups of rural people themselves.

For both categories of training suggested above, AID will need to make an independent assessment of the levels of personnel to whom training will be offered (post-primary, post-secondary, etc.), as well as the numbers of personnel for whom AID-sponsored training will be made available. Estimates of levels and numbers of personnel may begin with the requirements of AID-funded development projects commencing in FY 1975 and FY 1976 in the CWR area. Thereafter, the needs in these two training categories may be considered for offices and organizations linked and related to AID-sponsored programs.

Next, AID will require an up-to-date assessment of those institutions in the region and elsewhere which are capable of delivering the training required in these two categories. Because the personnel who are presently most in need of such training are ordinarily those who are too busy to receive it, the training must be available in a form which is on-site, short-term, and operational. For longer term preparation, diploma and degree training may be suitable. In making this assessment of training institutions, AID should pay particular attention to regional organizations which AID already supports to do this work (CAFRAD, PAID). But recognizing the great need for this training, AID must further encourage the more rapid development of countries' own capacities to perform this training. AID's share in funding CAFRAD's new program to prepare project management trainers from member countries is designed to build up national training programs in this discipline. Perhaps more should be done to accelerate the impact of this CAFRAD program and to ensure its results.

AID's support of PAID should be reviewed: (i) to ensure that PAID's Center for Project Management (CPM) is pitching its present project management training at the appropriate level (currently, at the post-university level);

(ii) to check whether or not the efficiency of CPM training programs could be improved, perhaps by expanding the present offering from two to four cycles and/or by ensuring a closer integration of faculty resources between CPM and PAID's Ecole de Cadres and Du Sautoy College; and

(iii) to ascertain whether PAID could be more extensively used, without overloading its present capacity, perhaps by developing short-course, on-site training programs through the Ecole de Cadres, and/or through additional CPM's established in other countries.

2. Regional Communication

Without fresh perspective, CWR governments risk repeating past mistakes in the design and management of education reforms and initiatives. To thus compound the costs and inefficiencies of the present system would be to impose an intolerable burden on CWR state systems which are already education poor.

The training prescribed in the proceeding section could provide an essential part of this fresh perspective. But in addition to this training, the persons in the CWR countries responsible for rural education (in the broad sense) have much to teach each other directly. Funds and opportunities for program specialists to visit comparable programs in other countries, or to otherwise share information at working levels, are lacking to a surprising degree in the CWR area. Thus, effective projects in one country are often unknown in the next, where similar initiatives may be underway.

As an important remedy to this deficiency, AID should provide funds to bring together key education personnel responsible for formal and non-formal programs of similar types, where such interchange may be of direct or indirect benefit to AID-funded activities.

3. Direct-Hire Specialists

Should AID determine that functional education represents an essential ingredient of any long-term package approach to the development of the rural peoples of the CWR area, then AID will need to assign a minimum number of direct-hire field specialists to design, supervise, evaluate, and coordinate AID-funded program initiatives, on the country as well as on the regional level.

Given this determination, AID will require staff specialists knowledgeable in the profession of human resources development and familiar with the functional education picture region-wide: with the successful projects, the failures, the key host-country professionals, the needs at national and local levels. These direct-hire officers (termed Human Resource Development Specialists) would be depended upon:

a) to assist with the design and management of AID-funded projects and parts of projects (regional and national); as well as

b) to encourage a continuous process of communication across borders among and between AID officials and CWR nationals who are concerned with the development of functional education systems. Neither the individual project managers nor the Country Development Officers could be expected to have the background, the time, or the international exposure between CWR countries to perform these functions.

To ensure this cross-border communication, these specialists should be given regional assignments, with responsibility for three or more countries with which AID is actively engaged. If AID accepts the regional and bilateral conclusions for human resources put forward in this document, a maximum of three specialists should be initially posted, one each to Dakar, Ouagadougou, and Yaounde.

D. Agriculture Research (Regional Programs)

1. Introduction

Agricultural research to improve food production and nutrition in West and Central Africa involves four key areas. These are: a) soil and water management, b) staple cereals, c) livestock, and d) farming systems.

These four areas are closely interrelated. Basic information is required on ways of managing soil and water resources if research derived improvements in cereal crops are to be provided. Furthermore, effective soil and water management techniques are essential in any effort to modernize the region's important livestock industry. Above all, unless recommended techniques and inputs for managing basic natural resources, for increasing yields of staple cereals, and for increasing the productivity of animal resources are acceptable to farmers, they will not be integrated with existing farming systems or be substituted for traditional systems.

Consequently, a thorough knowledge of farming systems is a prerequisite for the practical application of research results in the other key areas. At the most practical level, basic understanding is required of the ways in which farmers perceive risks and of the criteria they apply to recommended inputs and techniques. This understanding is required if the chasm which exists in the region between research organizations and the vast numbers of small farmers and herders is to be bridged.

2. Research Capabilities

Each of the countries in the Central and West African region maintains a research institute or set of institutes that carry out research in the first three key areas (soil and water, cereals, livestock). In the fourth area, farming systems, very little has been accomplished, although some systems research has been done at Ahmadu Bello University in Northern Nigeria, at the Centre National de la Recherche Agronomique (CNRA) in Senegal, and at the Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM) in Ivory Coast.

Most of the research in cereal crops is carried out by national institutes managed by IRAT (the Institute de Recherche de l'Agronomie Tropicale et des Cultures Vivrieres), one nine institutes established by the French colonial administration to carry out agriculture research in overseas territories.

The other eight research institutes: CTFT (Centre Technique Forestier Tropical), forestry; IEMVT (Institut d'Elévage et de Medicine Veterinaire des pays Tropicaux), livestock; IFAC (Institut Francais de

Recherches Fruitières Outre-mer) fruits; IFCC (Institut Francais de Café, du Cacao et d' Autres Plantes Stimulantes), coffee and cocoa; IRCA (Institut de Recherche sur le Caoutchouc en Afrique), rubber; IRHO (Institut de Recherches pour les Huiles et les Oleagineuses), peanuts and oil seeds; IRCT (Institut de Recherches du Coton et des Textiles Exotiques), cotton and other fibers; and CEEMAT (Centre d'Etudes et d'Experimentation de Machinisme Agricole Tropicale). All of these research institutes belong to GERDAT, the Groupement d'Etudes et de Recherches pour le Developpement de l'Agronomie Tropicale, which functions to some extent as an international research institute. GERDAT's major tasks are to coordinate research among the nine organizations and to maintain liaison with other international research institutes such as IITA, IRRI, and ICRISAT.

In addition to national organizations, a number of interregional agencies or associations also carry out significant research programms in each of the key areas identified above. The West African Rice Development Association (WARDA) sponsored by AID, UNDP, and other donors coordinates rice research and development in 14 West African nations,* nine of which fall within the program responsibility of AFR/CWR. Very importantly, WARDA provides a link between IRRI (International Rice Research Institute), located in the Philippines (and not maintaining a facility in the CWR region) and national research organizations. One of WARDA's most important activities is the preparation of specialists and extension workers for member countries' national rice programs. The Scientific, Technical and Research Commission of the Organization of African Unity (STRC/OAU) has assumed the responsibility for regional research in cereal crop improvement. This activity, Joint Project 26, is largely supported by AID and is staffed and supervised by crop scientists of the Agricultural Research Service of USDA. In West and Central Africa, JP26 maintains a regional center in cooperation with the Institute of Agricultural Research at Admadu Bello University in Northern Nigeria. The research staff associated with JP26 includes geneticists, pathologists, entomologists, soil scientists, and a cereal technologist. JP26 places its major emphasis on maize, sorghum, and millet, in that order. Linkages with national research organizations are provided by field trials officers (FTO's) who conduct varietal trials of research stations located in almost every country of the region. The small number of field trials officers has imposed a serious limitation on JP26's outreach to the national research organizations. For example, one FTO resident in Maroua, North Cameroon has responsibility for conducting trials in Cameroon, Chad, CAR, Gabon, and Congo. Other JP26 FTO's have similar multi-country duties.

*Dahomey, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierre Leone, Gambia, Ghana, Guinea, Togo, and Upper Volta.

a) Agronomic Research

Agronomic research is carried out within a three-country sub-region under the aegis of the Organization pour la Mise en Valeur du fleuve Senegal (OMVS) by an agronomic research unit that cooperates with national research programs in the three OMVS member countries (Mali, Mauritania, and Senegal). OMVS agronomic research has emphasized irrigated rice production and soil-water, plant-water relationships. The work that this research unit is doing will become an important input into programs to realize the crop production potential of the Senegal Valley as the proposed infrastructure of dams and irrigation systems is realized.

IRAT and ORSTOM can themselves be considered interregional research organizations. IRAT, heavily financed by France, is headquartered in France, which coordinates its applied research activities. Exchange of staff, largely expatriate, and of research results between national programs is common. Crop varieties and techniques developed at one national center or station are tested at other national centers. ORSTOM, also heavily subsidized by the French Government, engages mainly in basic agricultural research. Its network of 20 research centers covers practically all Central West African countries as well as others in French-speaking Africa. One of its main contributions to African research has been in soil science. In this field, ORSTOM has undertaken pedological surveys, pedogonic studies and soil classifications.

The international network of research institutes also reinforces research capabilities in Central and West Africa. The international institutes are research centers staffed by international teams of scientists and trainees in various agricultural disciplines which undertake coordinated approaches to an agricultural production problem or set of problems common to several countries. The first such institutes were the International Center for Corn and Wheat Improvement (CIMMYT) in Mexico and the International Rice Research Institute (IRRI) in the Philippines. Their work in adaptive research, which culminated in the development of high-yielding varieties of wheat and rice, contributed to substantial increases in the output of these cereals in South and Southeast Asia during the mid-to-late 1960's. Subsequent experience with these innovations developed by the international research institutes have demonstrated how essential it is to have effective national research and extension organizations to make use of the results of research conducted by the international institutes.

The main responsibility for arranging the financing of the international research institutes lies with the Consultative Group on International Agricultural Research (CGIAR), a consortium with a membership of 30 governmental and other donor agencies under the leadership of the IBRD. CGIAR has financed the establishment of one environmental institute in the CWR region and is studying ways of promoting the involvement of others in the region.

The International Institute of Tropical Agriculture (IITA) was established at Ibadan in Nigeria by CGIAR with a mandate to improve the quantity and quality of food crops common to the lowland humid tropics. IITA has four basic programs designed to fulfill this mandate: farming systems, cereal improvement (rice and corn), grain legumes (cowpeas and soybeans), and roots and tubers (manioc, yams and sweet potatoes). Each program is multi-disciplinary in nature. The three foodcrop programs are focused largely on improved techniques, that is on improved varieties and associated cultural practices. In farming systems, technology from the crop program is used to develop simulated farmer-based cropping systems.

In 1972, CGIAR created at Hyderabad, India the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). ICRISAT has the responsibility for conducting research in semi-arid tropical areas, where evaporation is greater than precipitation during five to ten months of the year or where annual hydrometric measurement, due to long dry seasons, does not reach 1200 mm. Because of ICRISAT's mandate to carry out research in the semi-arid tropics, its program deals mainly with sorghum and the millets, both of which are vital to West and Central African agriculture, and with the grain legumes, especially cowpeas, pigeon peas, and chickpeas. ICRISAT has proposed setting up sub-stations at two locations in Africa, one at Bambey, Senegal and the other at Zaria in Northern Nigeria. Bambey is already the site of the major IRAT research center in the region, and has a long and technically productive history in millet and sorghum as well as in farming systems research. Zaria is the site of JP26, the major cereals project, where studies are underway on breeding pest-resistant strains of maize, sorghum, and the millets with attractive qualities as food. JP26 is scheduled to be phased out in 1976 and a serious break in the continuity of this research on the major staple grains of the region can be avoided if ICRISAT assumes the responsibility for continuing the valuable research already begun.

While there is much to build on in the research results obtained by both IRAT in Senegal and across the region and by JP26, there are still deficiencies which can be corrected by a well-conceived international institute research program carried out by ICRISAT. These deficiencies include the relative absence of farming systems analysis contained in the research program at Zaria, insufficient attention to breeding millets and sorghum, and inadequate numbers of field trial officers who would become the critical links between the international institute and the national research organizations.

Ideally, national agricultural research organizations should be prepared to make use of the results of research obtained at international centers and vice versa. In reality, in West and Central Africa, these linkages are not well developed. The level of financing of the international research institutes such as IITA, of the interregional programs such as JP26, and of the African research organizations does not

foster the development of such linkages. National research programs are inadequately funded and lack trained people in the agricultural sciences who can interact with the personnel of the international centers.

There is currently a particular shortage of agricultural economists, plant breeders, plant pathologists, as well as of scientists in related fields.

b) Livestock Research

In livestock research, primary emphasis has been placed on veterinary medicine. Livestock production research has been and continues to be secondary. Research on feeds and the feeding of livestock has been the most neglected. Veterinary research and to a certain extent research on production has been carried out on a national basis by the Institut d'Elevage et de Medecine Veterinaire des pays Tropicaux (IEMVT). The main laboratories in the region managed by IEMVT are at Dakar-Hann in Senegal, Ndjamena-Farcha in Chad, and Niamey, Niger; experiment stations are located at Bouaké in the Ivory Coast and at Wakwa in Cameroon. IEMVT has collected and synthesized information on rangeland and pasture for most of the area covered by the West and Central African Region.

The International Livestock Center for Africa (ILCA) has recently been established in Addis Ababa, Ethiopia. Although newly established, ILCA already has strong links to IEMVT and to its network of centers and stations. ILCA should be able to take the lead in reorienting livestock research to those areas that have hitherto been neglected: forage production, range management, nutrition and the economics of production and marketing.

3. Research Progress and Research Needs

Although there are major deficiencies in the agricultural research capabilities of countries in the region, some impressive results have been obtained from research on soil and water management, staple cereals, and livestock. With the exception of research conducted at CNFA in Senegal, research on farming systems has been virtually nonexistent in the CWR region.

a) Soil and Water

ORSTOM has been responsible for most of the soils research. Most of its work has been in pure research with little or no attention to management or applied aspects. Applied research on soils has been carried out by IRAT in conjunction with its program of food crop research. ORSTOM has developed valuable information on soil origins and broad soil classifications. Soil conservation research has never been a primary focus of either pure or applied pedological research in the

region but some work is being done by ORSTOM at its center in Ivory Coast on ridging, mulching with stubble, and providing protective cover against the destructive impact of rain.

The development of farming tools and equipment is closely related to research on soils, particularly soil management and conservation. The Centre d'Etudes et d'Experimentation du Machinisme Agricole Tropicale (CEEMAT) located in Dakar has developed ox-drawn equipment, but many poor small farmers cannot benefit from these innovations because of the high capital cost of draft animals and associated equipment. Draft oxen as well as CEEMAT equipment are widely used in the Senegalese peanut basin but campaigns to introduce animal traction elsewhere in the region have not always met with success for a variety of reasons, including the relatively high capital cost of draft oxen and draft equipment, animal health problems, and the competition for labor time between cash and subsistence crops.

One major need in soils research is to broaden the valuable work on soil surveys into land-use and land-capability studies. In many areas the scale of existing map coverage will need to be analyzed to make the results of soil surveys and land capability studies useful in programming and implementing agricultural project activity. The Soil Conservation Service (SCS) of the U.S. Department of Agriculture is well equipped to make use of the work already done by ORSTOM to develop land-use capability classifications.

A second major area of research in soil management is conservation and improvement of soil fertility as crop production intensifies in response to the food requirements of a growing population. In many parts of the region, e.g., in Upper Volta and Niger, fallow time has been drastically reduced or eliminated entirely and marginal lands have been brought under cultivation to meet the subsistence needs of rural people and the food demand of rapidly growing urban centers. Yields of staple cereals are already stagnant or declining and they can be expected to decline even further unless soil fertility is maintained and improved. Extensive application of nitrogen fertilizers in food crop production appears for the time being uneconomic. Yet most of the research on soil fertility and cropping has been based on optimum doses of nitrogen fertilizer as integral parts of recommended "packages." Alternative approaches require increased attention, particularly the fertilizer effects of the use of nitrogen-fixing grain legumes, second in importance after cereals as a food crop. The addition of nitrogen to the soil by other means, e.g., manuring, composting, or plowing under, also requires study.

The lot of the subsistence food crop producer is one of drudgery and the availability of human labor is often the limiting factor in expanding production, not only of food but of other crops as well. There is considerable scope for devising simple, inexpensive machinery

for plowing, planting, weeding, spreading manure and fertilizers, applying herbicides and pesticides and for harvesting. The key economic criteria that such innovations must satisfy are reducing the amount of labor time required and/or reducing the number of operations required for cultivation. In addition, the innovations must be low cost if they are to be adopted by the majority of poor farmers.

b) Water

Water availability is the limiting factor in crop production in many parts of the Central and West Africa region and particularly so in the semi-arid Sahelian Zone. Not only there but all across the region, rainfall is variable and rates of evapo-transpiration are high because of low relative humidity, high temperatures, and high winds. Optimum use of the water resources -- ground water, surface water, and precipitation -- is an essential factor in any strategy to increase food production and improve nutrition in the region.

The countries of the region are not well equipped to carry out research on water resources and water management, although French and international organizations have carried out some useful water research in the area. The Bureau de Recherche Géologique et Minière (BRGM) has studied and mapped the ground water resources of much of West and Central Africa and WMO has led valuable agro-climatological studies in portions of the region.

The collection and processing of meteorological data is carried out in each of the countries in the region. In most cases, the network of stations is too small to provide comprehensive or adequate information. Rainfall data are collected at every station but other important variables -- wind deviation and velocity, cloud cover, rates of evapo-transportation, etc. -- are not always collected. Meteorological data is not effectively fed into the agricultural planning process at local, national or regional levels.

The consequences of the absence of research on the management of water resources are evident, especially in the Sahelian Zone of the region. Problems of desertification, soil erosion and soil fertility are emerging to offset the anticipated benefits of development efforts. Major needs in water management include drought related studies, the establishment of a regional network of water data stations, and the creation of regional centers for coordinating research and data processing and for training meteorologists, agro-meteorologists, and hydrologists.

The United States possesses certain unique capabilities for contributing to an international program designed to meet the water management needs of the Sahel. Specifically, U.S. knowledge, experience and technology with respect to systems analysis, network design and

collection, and the processing of remotely sensed data are particularly relevant and can become the basis for a significant U.S. contribution to a multi-donor project to design and implement a regional water data network for the Sahel.

c) Cereals

Research on maize, sorghum, and millet has been carried out by IRAT, JP 26, and IITA. A strong maize research program exists at IITA in Ibadan, Nigeria. The breeding and selection of improved varieties of sorghum are concentrated in Senegal, where IRAT's main research station is located at Bambey, and also in Niger at Niamey and Kolo, in Upper Volta at Farako-ba, and in Cameroon at Maroua. Bambey and Farako-ba are also important national centers for millet research and have emphasized the breeding of early tillering varieties and radiogenetic selection of highly productive short-stemmed varieties.

Experiment station results with high yielding varieties have been excellent, but sorghum and millet yields on farms are generally much lower than the yields obtained on the station. Optimum fertilizer applications and complete control of production practices on research stations virtually guarantee high yields but this maximum input package cannot be duplicated for the most part by farmers in their own fields.

The high yielding varieties of maize, sorghum and millet have not been widely disseminated or adopted by farmers because of inadequate facilities to produce and distribute the improved seed and because of the virtual absence of a link between research and extension activities. Extension services, themselves, are not sufficiently financed, trained or equipped to carry a program of improved cereal production to the farmer. Credit required to purchase the new seeds and associated inputs are usually lacking. The micro-economics of packages recommended by experiment stations (particularly their labor requirements) are unknown. Moreover, storage, transportation, and marketing systems are often not well enough developed to handle the farmer's increased output. Research on input delivery and marketing is a critical need in addition to research on farm production systems.

c) Rice

Rice is of growing importance in the CWR region. Demand for rice is increasing particularly in the rapidly growing urban areas. Rice is grown in four distinct cropping patterns: (1) as an upland, rainfed crop; (2) in paddies; (3) in mangrove swamps; and (4) in naturally inundated lowlands. Upland rice accounts for most production in the area. Irrigated rice is grown on only a small percentage of the total rice area.

Rice research is carried out on a national basis by IRAT, and regionally by IITA and WARDA. Many of the same technical and economic problems that exist for the staple cereals also exist for rice. In particular, the technology and economics of upland and lowland rice have not been adequately studied. It may be that these production systems offer promise of increasing both the food production and income of many poor farmers.

The needs for research on maize, sorghum and the millets in the region are similar. These include breeding varieties for adaptation to changing farming systems, for better yields, for better nutritional qualities, and for resistance to pests and disease. Control of specific African pests such as weaver birds (Quelea quelea) and witchweed (Striga) are particularly challenging research problems. Most importantly, the existing technology developed by IRAT, JP 26, IITA, and other research organizations could be used more effectively if farming systems were established by which the farmer could derive the greatest amount of food and nutrition from the staple cereals he produces. Improved rotations and mixed farming enterprises that include food crops, cash crops, and livestock both as an input (draft animals) and as an output (meat and milk for subsistence and sale) are critical needs.

The research requirements for improving cereal production and nutrition in West and Central Africa are great. Resolving the technical and economic problems that are present will require a comprehensive and coordinated approach involving national, international, and interregional research organizations. No single country can make the investment that cereals crop research requires. None of the countries in the region is presently able or equipped to handle adequately the research tasks. The greatest need of the national research organizations is for trained agricultural scientists -- agronomists, plant breeders, plant pathologists, entomologists, agricultural economists -- to carry out and expand existing research programs. National research organizations will need additional donor support to carry out and enlarge where necessary their own cereals research programs. Much, though not all, of this support can be in the form of project assistance in which research organizations and research results are involved in implementing a cereal production activity. Countries in the region should increase the allocation of their own resources to research, but the magnitude of the research required will call for heavy donor assistance from many sources.

Regional organizations have been evolving to meet cereals research needs that extend beyond national boundaries, e.g., IITA, JP 26, and WARDA. Such regional and international research institutes can undertake research responsibilities that fall outside the scope of a national program: training in agricultural sciences and field work; organizing regional seminars, conferences, workshops; conducting regional field trials; focusing an international team of agricultural scientists

on a problem common to a region; and maintaining facilities adequate to handle large collections of plant materials and the large number of items required in a program of selection, breeding and regional trials. Donor cooperation and coordination in financing this research will be essential.

e) Farming Systems

[redacted]

the personnel in agricultural sciences available to it as an international institute to carry out farming systems research. Similar approaches should be carried out with respect to livestock production and range management systems, as well.

4. Recommendations

The importance of the agricultural sector, both food crop and livestock production, to the countries in the region has been discussed in the overview and elsewhere in this document. In carrying out programs and projects designed to increase the level of food production or improve standards of nutrition, policy makers, planners, farmers and herders need agricultural research results to predict the most likely outcomes of alternative courses of action. Four key areas in support of food production and nutrition programs for the region have been identified. These should be given priority in AID's efforts to strengthen the research capabilities of both national and regional research organizations. If the results of agriculture are to be used effectively, then international, regional, and national research organizations must be able to undertake programs that are complementary. National agricultural institutions should exist that can make use of the results of research conducted at the international centers, and vice-versa. There is a role for international research institutes when the problems or needs for research cut across national boundaries and when research problems are of such priority that they require a large-scale effort. Research on soil and water management, cereals, livestock, and farming systems meet both these criteria. The following specific recommendations relate to regional agricultural research.

a) Soil and Water Management

Soil management: In order to assist countries and donors in the region in designing and implementing agricultural production activities, AID should undertake to build on the soils research of ORSTOM, IRAT and others. These research organizations already have the results of surveys giving soil genesis and broad classifications. The next step is to develop land use and land capability classifications from the research already available, and from additional surveys, as needed, to cover the entire Sahelian region. The Soil Conservation Service of USDA has perhaps the greatest capability of any soils research institution in the world to carry out such a program. Special attention should be given to the Sahelian Zone initially; but ultimately large areas which will be cleared of tsetse fly and of the fly-vector of onchocerciasis will also require detailed surveying and mapping for project planning.

Water Management: Water availability is the greatest limiting factor in crop and livestock production in the Sahel. Both national and regional programs in this part of the CWR region need

assistance in strengthening water data networks and the linkages that should exist between the network as a source of information and users, i.e., policy-makers, planners and producers. At the national level, meteorological and hydrological services need assistance in developing or expanding their capabilities to coordinate these efforts, and to more effectively disseminate the data they gather. At the regional level, there is the need to establish or strengthen a regional water resources center capable of coordinating the processing and interpretation of water data for the Sahelian Zone as a whole, providing longer term forecasts, and training African meteorologists, agro-meteorologists, and hydrologists.

b) Cereals

No single country in the region can finance or implement the extensive research that cereals crops require. Because cereals research problems are common to broad ecological zones which stretch across the region, and because large-scale and expensive efforts are required, there is ample scope for the involvement of the international research institutes in cereals research. AID should actively seek the involvement of ICRISAT in research on millet and sorghum in the region. Because of its mandate to do research on agriculture in the semi-arid tropics, ICRISAT is the logical successor to JP 26 when that project is ended in 1976. In addition, ICRISAT and IRAT would derive mutual benefit from a formal association at the CNRA - IRAT research center in Senegal. Specifically, ICRISAT would carry out research on the development of high yielding varieties of longer season sorghums (and perhaps corn) at the site of JP 26 in Zaria, Nigeria; and of short and medium season millet and sorghum in association with IRAT at Bambey, Senegal. ICRISAT would also be responsible for (1) training agricultural scientists and field workers vitally needed to man national research organizations, (2) conducting field trials throughout the region with a much enlarged corps of field trials officers, (3) developing a farming systems research program along the lines of that currently underway at IITA, and (4) maintaining close liaison with national research and other national organizations or agencies.

National programs will continue to have responsibility for much of the adaptive and applied research in cereals extension seed production, multiplication and distribution; development of storage, processing, transportation and marketing systems; and for agricultural (including input and price) policies. AID is already involved or anticipating involvement in a number of bilateral food production activities that seek to strengthen these national capabilities; e.g., seed production, multiplication, and distribution in Upper Volta, Cameroon and the Central African Republic; extension in Niger; and grain marketing and price stabilization in Niger and Upper Volta.

AID should give special support to the maize research program carried out by IITA and to those of national research organizations.

The cultivation of maize is spreading across the more humid ecological zones of the CWR region. Maize can be grown almost invariably in areas where sorghum is grown. The development of high-lysine varieties by U.S. researchers is a significant research breakthrough which would reduce protein deficiencies wherever maize is or could be a major component of the diet. IITA which has a high-lysine maize program is limited in its capacity to undertake outreach activities across the region because of constraints imposed by financing, personnel, and facilities. AID should consider funding of special projects in maize research which would permit IITA to carry out programs in association with national research organizations. IITA research in association with ONAREST-IRAT in western Cameroon would be a logical area in which to begin such an activity. There maize is already an important subsistence crop and potentially a source of income to small-holder producers.

c) Farming Systems

The nature of farming systems research is such that it must be carried out by researchers who can maintain close contact with working farmers. Ideally national research organizations should be able to carry out this research but the capability and experience in this field are more readily available from the international institutes. Although IITA has taken the lead in farming systems research in the region, the scope of its research has been limited to the immediate geographic area of its headquarters in Nigeria. Financial constraints preclude the expansion of this critical element of IITA's research program beyond Nigeria at the present time.

AID should give special support to IITA to extend its farming systems research program to other areas in the region. Because of the multi-disciplinary nature of this kind of research, it would have to be undertaken in close association with selected national research organizations that already have specialists trained in the "hard" agricultural sciences. Special funding would permit IITA to provide coordination, orientation, systems analysts and agricultural economists required to conduct this research. In addition, IITA in carrying out its training responsibilities could prepare new and existing personnel to staff out farming systems research units in national organizations. A similar role for ICRISAT should be devised as its involvement in the CWR region becomes greater.

E. Health (Regional Programs)

1. Assignment of Regional Health Planner

Contrary to what may be the case with regard to agriculture and livestock, whose problems have been discussed by the Agency many times under many different circumstances, the problem of improving the delivery of health services in the rural areas is a relatively new focus for the Africa Bureau. In the past, the Bureau's programmatic response in the health sector has been limited to participation in disease eradication and control projects (such as the measles/smallpox vaccination program), health education projects (such as the University Health Sciences Center at Yaounde), and the sponsorship of occasional conferences and seminars. There have been no AID health officers stationed in the region who could provide guidelines for programmatic initiatives in this area. (A start has been made by stationing a health officer in Yaounde to cover Cameroon, Togo, Dahomey, Central African Republic and Gabon.) Thus, until the DAP teams visited the region in October, 1974, there was a paucity of direct information about health programs, infrastructure, financial resources and personnel capability. Perhaps more importantly, there was no history of personal relationships with health officials in these countries, relationships which are necessary in assessing a nation's absorptive capacity for technical assistance.

While the health members of the DAP team were able to remedy this situation to a small degree, by obtaining firsthand information on host country plans and programs, the time frame within which they worked prohibited making more than a superficial analysis of the needs. Thus, while it is fairly easy to describe the disease problems of the CWR countries and, thanks to the information gathered by the DAP teams, to indicate host government health priorities and infrastructure as they exist on paper, it is more difficult to pinpoint strengths and weaknesses with precision and to recommend specific AID inputs to improve the health status of the rural majority at this time.

This is the reason for recommending that the most important AID project for the region at this time should be the assignment to Dakar in FY 1976 of a French-speaking health officer with experience in health planning, epidemiology and nutrition. This assignment could be made as part of the present regional project Strengthening Health Delivery Systems, or in addition to that. It would be his assignment to work with AID representatives and counterparts in the host countries outside the jurisdiction of the Yaounde regional health officer to develop specific AID health projects for CWR, both on a regional and a bilateral basis.

On a regional basis, given the considerable environmental manipulation which is at present being contemplated to harness the water resources of the Central West African region, the first concern of the planner should be to develop the best way to avoid the hazards inherent

to the projects considered, and to discover criteria for determining which activities should be carried out on an interstate basis and which should be carried out by national governments. The planner's second priority should be to explore the possibility of establishing a regional nutrition surveillance capability. Both of these projects are discussed in more detail below.

On a bilateral basis, the planner should focus first on the countries which seem to be most receptive to, and most in need of. US assistance in the field of health and nutrition planning, namely Senegal, Mali, Mauritania, Ivory Coast and Niger. (see Country Recommendations). In working at the bilateral level, the regional health officer should concentrate on the development of low-cost rural health delivery systems. This requires that he focus on planning, evaluation and training.

a) Planning and Evaluation

In cooperation with his host country counterpart, he should evaluate the country's health resources in terms of its facilities, personnel, equipment and finances. He should search for the best way to set up a comprehensive health delivery system in the rural areas, a system that will mesh with the existing infrastructure and utilize existing resources insofar as possible. The planner should explore the means of tying in to the 20-country project, Strengthening Health Delivery Systems, to provide the necessary regional training and planning back-up to the individual countries. He should assist the host government in selecting an area best suited to start improved rural health delivery services, being guided by the potential interest of other donors and by the preferences of the host government. He should also explore how best to set up goals which can serve as successive benchmarks for evaluating the development of an efficient rural health delivery system. He should work with his counterparts to estimate the financial resources, both national and external, which can realistically be counted upon to support such a program. He should assist in defining targets to be reached at the end of each five-year period. These efforts should culminate in a comprehensive plan of action to be presented to AID and other donors for review and discussion, with a view to funding projects in FY 1977.

b) Training

In cooperation with his host country counterparts, the US technician should help the Ministries of Health to reach decisions as to:

- What kind of personnel to train in order to implement the rural health delivery system
- How many of each kind

- Where training should take place

- What staffing targets to aim for over a 5-10 year period.

In all these activities, the US planner should be able to avail himself of consultants as needed.

2. Supporting the Control of Transmissible Diseases

Throughout Central West Africa transmissible diseases are endemic. Each country has on paper a national Service des Grandes Endemies for providing local surveillance and control. This service involves periodic surveys of human infection and of vector or intermediate host breeding. It also involves taking the necessary measures to make the environment unfavorable for the survival of the vectors and/or intermediate hosts. However, these national services seldom have the technical personnel and facilities required to do the work, and hence must call upon an interstate organization such as the OCCGE (Organisation de Coordination et de Cooperation pour la Lutte Contre les Grandes Endemies en Afrique de l'Ouest - Organization for Coordination and Cooperation of the Fight Against the Great Endemic Diseases of West Africa) to provide the needed technology and advice. This agency must charge member states for its services and hence control programs go begging.

Since water plays a role in the transmission of so many of these diseases (e.g., schistosomiasis, onchocerciasis, trypanosomiasis, malaria, guinea worm), this problem is going to be further exacerbated by the programs launched in most countries of the region to develop water resources. These projects range from the great Senegal and Niger river basin development schemes to the construction of small barrages on minor streams.

These projects open possibilities for expanding the area of risk of schistosomiasis (by enlarging the breeding environment of schistosome cercariae-bearing snails), malaria (by enlarging the surface of mosquito breeding), trypanosomiasis and onchocerciasis (by widening the possibility of glossina and/or simulidae breeding if certain ecological conditions are met). Moreover, the concentration of a labor force to construct these projects in an area where only poor and sometimes no health resources exist can create considerable health hazards, such as increased tuberculosis and malnutrition, venereal disease and many other diseases whose infectious agent can be directly transmitted to man if preventive measures are not taken. Concentration of new settlers in a new area can result in serious epidemics if not carefully planned, and there is at present no evidence that such plans have been made. Interventions to prevent adverse health results from such projects can take several forms, including:

a) Providing funds for building into water development projects appropriate sanitary engineering services at the planning stage; and

b) Supporting a regional technical organization capable of providing such sanitary engineering services, as well as the entomological, parasitological and lymnological studies needed to maintain surveillance of these transmissible diseases. This could be done either by expanding the capabilities of the already existing OCCGE, or by creating a new entity.

The OCCGE, located at Bobo-Dioulasso in Upper Volta, was created in 1960. Member states include the Ivory Coast, Dahomey, France, Upper Volta, Mali, Mauritania, Niger, Senegal and Togo. It is supported partially by the member states, in part by foreign international and bilaterial assistance, and finally by subsidies for certain specific projects requested by the individual states. The 1974 budget amounted to about $2 million. The organization's activities include applied medical research, specific operations requested by the member states, teaching and training, technical scientific exchange and coordination with other major scientific organizations. The OCCGE is supported in its work by five major research institutions employing 498 technicians: the Centre Muraz at Bobo-Dioulàsso which has sections for parasitology, biology, medicine, entomology and pharmacology; the Marchoux Institute at Bamako with a section on leprosy; the Institute of African Tropical Ophthalmology at Bamako concerned with eye diseases; the Agency for Food and Nutrition Research in Africa (ORANA) at Dakar; and the Entomological Center for Onchocerciasis at Bouaké (Ivory Coast).

Several problems would be encountered in upgrading this organization: improvement would involve the addition of a strong sanitary engineering section and would require negotiations with France to establish a modus vivendi acceptable to all concerned, reflecting the multi-donor character the organization would have to take. The limits of its responsibilities with regards to national institutions would also have to be carefully defined. Evaluation of the possibility of broadening OCCGE's scope of activities along the lines indicated could be one of the responsibilities of the Dakar-based health planner.

3. Obtaining Essential Drugs

Given the high cost of drugs, most countries rely heavily on donations from pharmaceutical firms for drugs whose expiration date has been or is about to be reached. While this system allows the countries to receive pharmaceuticals at low or no cost, it results in the acquisition of many types of "luxury" drugs which remain unused on the shelf while the supply of the few essentials really needed is inadequate.

The US could consider taking the initiative in promoting a "Drugs for Peace" scheme, whereby pharmaceutical companies in the developed nations would establish a stock of the 10-12 most essential drugs for preventive and curative medicine to be made available to the countries of Central West Africa at concessional prices until national manufacturing or purchasing capability is developed. Outright donations could also be envisaged for use in the poor rural areas or in times of emergency. At the same time, the logistics for establishing an adequate and economic cold chain for fragile vaccines should be worked out. Negotiations with the drug companies to establish this project should take place at the Washington level.

4. Supporting Development of a Nutrition Surveillance Capability

Since malnutrition is one of the region's major health problems, even in normal times, development of a nutrition surveillance system would be a valuable contribution to preventive medicine in Central West Africa. Personnel at WHO and elsewhere have already given thought to the kinds of indicators (health, economic, hydrological, meterological and sociological) that would signal the imminence of nutrition crises or "epidemics." Such warning signals would alert governments and external donors to take preventive measures, such as moving food supplies to potential famine areas, before the situation becomes critical. The possibility should be studied of building such a surveillance capability into the already existing regional organization ORANA at Dakar. ORANA is a branch of the OCCGE and is competent in all matters of nutrition, especially nutrition surveys, studies of protein-rich foods, analyses of weaning foods, relationships between nutrition and infectious diseases, studies on anemia and goiter. The creation of such a resource would be extremely valuable in supporting and upgrading health and nutrition and creating inroads into the life of the rural populations. Again, evaluation of the possibility of upgrading ORANA could be added to the list of responsibilities of the Dakar-based US health planner.

5. Support to National Health Delivery Systems.

AID assistance to this effort should be made through regional vehicles, such as the Lomé and Lagos training centers as assisted by the Strengthening of Health Delivery Systems project, as well as through national programs discussed in the country program section. The problem of how to deliver health services to the rural majority is a problem common to all the countries of Central West Africa. The basic pattern for dealing with the problem is the same throughout the region with minor variations. In general terms, the development of an extensive health delivery system, whether in Senegal or Niger, involves five imperatives:

a) Creation or completion of the infrastructure for delivery of health services.

b) Training new health workers, recycling already existing personnel, establishing an effective supervisory system.

c) Providing health supplies: drugs, cold chain, storage, resupply systems.

d) Establishing transportation facilities for mobile units: vehicles, fuel, maintenance services.

e) Obtaining budget support and investment from external sources on a diminishing scale basis.

Infrastructure: Working from the village upwards, the health delivery system infrastructure should consist of:

a) the village health post with a village health agent;

b) visiting mobile health units;

c) secondary fixed health centers;

d) primary health centers; and

e) regional health centers.

With the exception of the village health post/agent, the health plan of most CWR countries is already based on this organizational concept. Implementation of the concept, however, is very uneven and is usually unbalanced in favor of d) and e) in urban areas.

Personnel: The quantity and quality of personnel is a constraint to program implementation in all countries. Training programs for new personnel should be expanded and carefully structured to provide orientation in preventive medicine and they should be much more applicable than at present to the conditions workers will face in the field. In-service training programs (on-site whenever possible) should be organized to insure that personnel at all levels are following current practices and to provide stimulation and supervision. Special emphasis should be given to training village-level health agents who do not now exist, except in Niger. There, an interesting program has been implemented to train local health men who will provide the missing link between the rural dispensary or secondary health post and the village. This village health agent is the basic foundation of the health service pyramid. He should be a member of the community, possess a minimum level of literacy and be present in the village at all times. He should be given a short training course to teach him how to provide first aid, how to treat symptoms such as fever and diarrhea, how to recognize cases needing evacuation to the nearest rural health post, and how to keep simple records on patients and

drug stocks. He should be provided with a basic supply of simple medicines (aspirin, nivaquine, etc.)

Equipment and Supplies: No significant improvement in the level of preventive or even curative medicine can be expected without adequate equipment, a reliable and sufficient supply of essential drugs, and the means for distributing and conserving heat-sensitive drugs.

Transportation: The infrastructure and personnel described above and the distribution of drugs and vaccines cannot operate effectively without adequate transportation facilities. The mobile teams, which are the essential tool for reaching the rural masses, are especially dependent upon the availability of reliable means of transport. Thus, provision of vehicles, vehicle maintenance facilities, and fuel is a sine qua non of the entire health delivery system. In Senegal and the other predominantly Moslem countries, the Arab oil producers might be interested in providing the fuel should the U.S. or other donors provide vehicles and maintenance facilities.

Budget Support and Investment: None of the above can be carried out without adequate funding. Since the countries in question are poor, the initial investment required to establish the necessary infrastructure, training programs, supplies and transportation facilities must come largely from external sources. Even budget support to pay for operational costs may be needed for a certain period. To avoid the vulnerability of eternal dependence upon outside sources, however, a health plan should be conceived in such a way as to allow for a gradual phase-out of external budgetary support. This requires careful consideration of the host country's own resources and capabilities.

All five of these inputs are essential to the development of any national health delivery system. The absence or inadequacy of any one input can jeopardize the rest. That does not mean, however, that the U.S. or any other donor must accept responsibility for supporting all five imperatives. A cooperative venture by external donors is entirely feasible, but requires more careful planning and coordination than has occurred in the past.

F. Onchocerciasis Regional Program Conclusions

1. Introduction

The Onchocerciasis Vector Control Program, initiated in FY 1974, is designed to radically decrease the incidence of "river blindness" in a seven state area in West Africa within a projected program time frame of 20 years. The program should have sufficiently eliminated the disease vector - Simulium Damnosum - 18 months after larvicide spraying is begun, to enable settlement of presently uninhabited or under-inhabited fertile river valleys in the program area. An important justification for this major $53 million multi-donor program is humanitarian relief: the decreased incidence of blindness (approximately one million cases in the program area) and related effects of the disease. But the primary justification for the program is human development. It is estimated that over 70,000 km^2 of relatively fertile river valley soil is unexploited due largely to the severity of onchocerciasis infection. Some of these valleys have been depopulated in recent history as a direct function of the increased incidence of onchocerciasis. Others, where the vector is equally abundant, have apparently not been occupied in this century. Preliminary estimates indicate that hundreds of thousands of people could be settled in these relatively fertile valleys and that full and proper agricultural exploitation of this land could produce annual yields valued at approximately $32 million per year by year 20 of the program.

The settlers of these river valleys would come from over-populated highland zones such as the Mossi Plateau in Upper Volta where growing population pressure on the land (which is inherently less fertile than most of the valley soils) has led to abandonment of fallow, gradually decreasing agricultural yields as the soils become less fertile, and heavy out-migration to urban settlements and less desirable farming areas. Despite the heavy population pressures, migrants from the highland zones have not dared venture into the river valleys because of onchocerciasis.

The program aims at the settlement of these valleys in ways that will: (1) ensure proper exploitation and maintenance of the agricultural potential of the valleys for production of food crops, cash crops and livestock; (2) ensure proper development and utilization of the hydrological resources of the area; (3) guarantee a minimum of government services to support the social and economic development of the population of the valleys; (4) and promote social harmony and minimize social/cultural conflict. The settlement programs will require major donor financial and technical assistance and sophisticated project planning and implementation. The risks are extremely serious since improper exploitation of these valleys, resulting in

degradation of the soils and water resources and in social conflict, would mean that a great portion of West Africa's few remaining virgin resource areas would have been wasted. It behooves the donor and African community to prove that major advances in the technology of endemic disease control can be matched by effective planning and implementation of economic development projects which will preserve and indeed increase the inherent value of lands freed from the scourge of endemic diseases.

In the early organizational meeting of African governments and donors concerned with the onchocerciasis vector control program, AID played a major role in stressing the need for early, detailed planning of economic and social development programs for the areas to be freed of onchocerciasis. Implementation of these plans will require major allocation of donor funds over a 20-year settlement period with much of the initial investment over the next five years. If AID is to match its resource pledge to the vector control program (approx. 10-15% of total program costs), it should plan to allocate $24-$35 million for economic development of the oncho-free zones over the next 15 years.

Although the economic development of the oncho-free zones, unlike the multi-donor vector control program, will be carried out through bilateral donor-host country arrangements, it is imperative that AID assistance be provided in strict collaboration and coordination with the assistance provided by other donors*. This means that AID should fully support those institutions concerned with coordination of economic development set up under the vector control program (The Economic Development Unit - Ouagadougou; the Economic Development Advisory Panel - under the auspices of IBRD) and such other bodies as may be created to facilitate the coordination of the economic development of the region (cf., a Volta River Basin Commission or Authority).

In preparation of this DAP, specialists visited six of the seven participating African countries (Mali excepted) in an attempt to develop a strategy for AID assistance to the oncho-free zones. This strategy attempts to provide a rationale for allocation of AID resources within the total contract program area and to suggest administrative mechanisms for providing AID assistance. Given the nascent state of planning for economic and social development of the oncho-free zones, however, these recommendations must be viewed as somewhat tentative. This section of the DAP will summarize the team's general recommendation

*The UNDP has already allocated $500,000 per participating country to assist in the basic research and planning (mapping, hydro-geological surveys, socio-economic studies) required for the preliminary design of economic development projects in the oncho-free zones.

for AID assistance. More detailed descriptions of the areas to be freed of oncho and possible AID interventions in the economic and social development of those areas are found in separate sections in each of the country analyses.

II. Priority Areas for AID Assistance

While parts of seven West African countries are included in the oncho vector control program, the relative priority of economic development of oncho-free zones in these countries varies significantly. The priorities for AID assistance should in general reflect the priority which each participating government gives to the economic development of their oncho-free zones within their national development plans and the degree to which they require donor technical assistance in order to obtain their development objectives. In general the countries have taken or are taking the following factors into consideration in determining the priority of the oncho zones within their national development plans: (a) the quantity and quality of land which will be opened up for potential settlement by the vector control program; (b) the severity of population/land pressure in other areas of the country from which migration could occur and the proximity of those over-populated areas to oncho-free zones; (c) the degree to which social/cultural conflict between ethnic groups living near or in the oncho zones and groups living in over-populated areas could hamper colonialization efforts; (d) the cost of economic and social development programs in oncho-free zones in relation to the cost of other priority development projects; (e) the availability of unexploited fertile land elsewhere in the country.

Using these criteria, the priority of oncho-free zone development in the participating countries is as follows:

First - Upper Volta
Second - Ghana
Third - Togo, Ivory Coast
Fourth - Niger, Mali, Dahomey

The following discussion, which summarizes recommendations for AID assistance country-by-country, takes an additional factor into consideration: the degree to which the African governments are able to finance their own development efforts.

Upper Volta

Upper Volta is the country whose development is most severly affected by the presence of onchocerciasis and which should most benefit from the oncho control program. Development of the oncho-free zones is the government's first development priority.

Approximately 10% of the land of Upper Volta is uninhabited or severely under-populated due to onchocerciasis. This area comprises the valleys of most of the nation's major rivers - the Black, Red and White Voltas, the Sissili, the Konpienga and the Lerabe. Much of this land is blessed with rich soils. With proper land and water management, these zones should produce very significant quantities of cash crops (especially cotton, rice, sesame), food crops (sorghum, millet, possibly corn), and livestock.

The valleys of the onchocerciasis program contrast sharply with the Mossi Plateau to the north where population pressure on the land is severe. If one assumes that 40 inhabitants/km is the maximum density for an area receiving under 900mm of rainfall, 33% of Voltaic farmers in 1970 lived in areas that were overcrowded. By 1990, at present population growth rates, 48% of Voltaic farmers would farm over-crowded areas. At present rates of population growth (approximately 2.4%) in 20 years these areas will contain about one million more inhabitants than at present. Thus one can estimate that at least one million persons must be relocated over the next 20 years if land pressure on the Mossi Plateau is not to worsen and substantially more must be relocated if land pressure is to be eased on the plateau and soils allowed minimum fallow periods to regenerate fertility. It is believed that proper development of the seven priority development zones* in the oncho area of Upper Volta could provide settlement opportunities for 600-700,000 Voltaics over the next 20 years.

Thus, while not fully resolving the population/land problem in Upper Volta, settlement of the relatively fertile valley zones provides a tremendous opportunity to improve the lives of 15-20% of all Voltaics, to slow and eventually reverse the decline of soil fertility in the plateau regions, and to provide a solid agricultural basis for economic development of the country through producton of cash crops, food crops and livestock in the valley zone.

The Volta Valley Authority (VVA), a public "société" with financial autonomy, has recently been created to plan and manage the development of the oncho-free zones of the Volta Rivers and their tributaries. It is not yet clear whether the VVA will also be responsible for the development of two other oncho-free zones - the Lerava River in the S.W. corner of the country and the Konpienga River in the Eastern ORD - which are not tributaries of the Volta rivers.

AID should consider providing major assistance to Upper Volta through two kinds of programs. First, AID could provide capital assistance (probably loan funds) to the VVA for use in one or several of the project zones. Funds could be earmarked for a) rural road construction, b) agricultural credit, or c) development of basic village

*Identified by an FAO/SEDES team as part of the WHO-directed PAG Mission.

infrastructure - wells, schools, dispensaries. This last activity might be structured so as to provide material and equipment for construction of facilities if local communities were willing to provide much of the necessary labor - possibly in exchange for PL-480 or World Food Program food and limited wages.

Secondly, AID could provide major capital assistance: probably grant funds for opening the Pama-Konpiengo zone in the Eastern ORD to settlement as an extension of the USAID Eastern ORD Integrated Rural Development Project. This action would be predicated upon prior studies which could determine the degree to which migrants would be attracted to the area from the Mossi plateau region. Should the Pama-Konpiengo zone remain outside the purview of the VVA, AID could provide technical assistance to the Fada ORD for planning and the initial management of a settlement scheme.

Ghana

Unlike Upper Volta, Ghana has not yet given high national priority to development of the oncho zones in the northeastern section of the country. Its national onchocerciasis committee is just now beginning to organize itself into an operational economic development planning unit. Nevertheless, given the severity of the population and land density pressures in Ghana's Northeast AID should plan to provide substantial capital and technical assistance if the government itself places sufficient priority on development of the oncho-free zones.

The priority oncho-free economic development zone of Ghana is one of the most densely populated areas in Africa (60 inhabitants/km^2) despite the presence of large cultivable valleys which are uninhabited or lightly inhabited because of the presence of oncho. Population pressure in some parts of the area (which comprises the Bolgatanga, Banku and Navrongo administrative districts) reaches 150 inhabitants/km^2. In the area presently being farmed, population/land pressure has led to decreased use of fallow and declining crop yields.

Given AID's difficulty in providing substantial French-speaking technical assistance, Ghana's position as the lone Anglophone country in the program area, combined with the obvious need for economic development of the oncho-free zones, makes it a prime candidate for major AID technical assistance in planning and implementing development projects in these zones. AID enthusiasm for such a role, however, must be tempered by recognition of the following factors: a) UNDP will undoubtedly agree to undertake basic studies in the onchocerciasis program area (hydrogeological, pedological studies, etc.); b) major German and IBRD agricultural development programs already exist or will soon begin in certain parts of the Upper Region; c) the Ghanaian philosophy

of "self-reliance" may minimize requests for donor technical - as opposed to capital - assistance in the program. Government officials have indicated that Ghana would welcome USAID assistance in development of the oncho-free zones, although with planning barely underway they could not state in what areas USAID assistance might be requested. In light of the above, it would seem prudent for AID to consider providing limited technical assistance for final project design and initial project implementation and major capital assistance for infrastructure development during the first phase of repopulation of the oncho-free zones if requested and if Ghana gives high priority to development of the oncho-free zones within the context of its development plan for the Upper Region.

The proposed USAID/Ghana project - Development Applications of Science and Technology - could provide AID with a second vehicle for assisting in development of the oncho-free zones of the northeast. The potential linkages between this project and economic development of the oncho-free zones of Ghana is discussed in the Ghana country annex which deals soley with the onchocerciasis program in Ghana.*

Togo and Ivory Coast

These two countries share the third priority slot for AID assistance to the economic development of oncho-free zones and also share certain common characteristics. A priority development zone was identified in each country by the FAO/SEDES team, but neither the amount of land to be opened up by the vector control program nor the severity of existing population/land pressures in nearby areas approach the scale of Upper Volta and Ghana. Also both countries, due to substantial export revenues (phosphate in Togo) and high rates of economic growth, are better prepared to fund a significant portion of the development costs of their oncho-free zones than are other governments participating in the program. Finally, present AID policy precludes bilateral grant assistance to these coastal countries, except in health and education activities.

Togo

The Sansanne'-Mango administrative district of the Savanes region was selected by the FAO/SEDES team as a zone suitable for a major relocation project. While much of the valley area can be

*USAID/Ghana does not fall under CWR administrative supervision. The USAID Mission has recently prepared its own DAP submission.

cultivated only after flood control works are constructed, some 30,000 ha are available for dry-land farming without extensive improvements. The project zone could attract settlers from the Dapongo district to the north which, although small, is densely populated (70-100 inhabitants/km^2).

Government plans for development of the oncho-free zone will be integrated into a high priority plan for development of the northern regions of Togo (Savanis and La Kara regions). There are indications that the government plans rather capital-intensive development of the river valleys in the north, including those flowing through the oncho-free zone. Studies for several major irrigation projects have been completed or are underway. The government reportedly hopes to encourage production of rice, sugar cane, soybeans, sorghum and vegetables, placing emphasis on production units which are "viable".

UNDP is presently providing major technical assistance to a settlement project in a non-oncho zone near Lama Kara. Conversations with the UNDP Resident Representative confirm earlier indications that the UNDP hopes to expand its activity eventually to the Sansanne'-Mango zone. Thus it appears that there will be no need for AID technical assistance to assist in final design, etc., of the Togo's oncho-free zone. Although considerable capital assistance may be required, especially if Togo chooses to build major water control and irrigation works in the Sansanni'-Mango area, prior to providing any capital assistance AID should carefully examine the degree to which resettlement projects are designed to develop small farm agriculture, rather than large "viable" agricultural units. In addition, given Togo's burgeoning phosphate export revenues, AID should carefully assess Togolese commitment to use these funds for agricultural development in the proposed project zones.

Ivory Coast

An oncho-free economic development zone of approximately 2100 km^2 has been identified about 80 km south of Korhogo and to the immediate west of Niakaramandougou in the northern Ivory Coast. Estimated cultivable area is about 56-80,000 ha. Although the northern region is sparsely populated as a whole and land is relatively abundant, there exists a major population cluster around Korhogo (50 inhabitants/km^2 within a 30-40 km radius) from which out-migration to the oncho-free zone is likely to occur.

Although little data is yet available on Ivoirien plans for development of this oncho-free zone, it is clear that development will be carried out within the context of the development plans for the northern and central regions of the country which geographically bisect the proposed project zone. Although the central region plan is not yet

available, the northern region plan mentions onchocerciasis as a development constraint only in passing and provides no indication of special priority to the oncho-free project zone. The government has, however, requested UNDP assistance in carrying out preliminary studies in oncho program areas.

Given the Ivory Coast's relative privileged economic status among countries included in the onchocerciasis program and the relatively moderate cost of the FAO/SEDES proposed initial 5-year pilot scheme ($2.09 m), it should not be a prime candidate for monies which AID sets aside for the economic development of oncho-free zones. Technical assistance for project planning will be carried out by UNDP and probably FAO. AID capital assistance in the latter stages of the settlement program should be predicated upon a positive evaluation of the pilot plan, clear indications that there is sufficient population/land pressure in the Korhogo area (along with a favorable attitude towards migration into the proposed oncho project zone) to colonize the area within a reasonable period of time, and the availability of AID resources within the context of the whole oncho program area.

Niger, Dahomey, Mali

The analysis of the FAO/SEDES team indicated that none of these countreis contained areas affected by onchocerciasis which should be considered priority zones for economic development. Although pockets of hyperendemic onchocerciasis exist in each country, these areas are either a) not sufficiently large, b) not near enough to densely populated areas to serve as emmigration zones, c) located in regions which already benefit from major economic development project activities. The portions of these countries included in the vector control program area are found at the edges of the program area and may have been included as buffer zones against vector reinfestation rather than because of the local severity of the disease or the economic development potential of zones affected by it. The DAP team does not feel that major AID assistance to these countries can be justified by onchocerciasis alone. However, this should not preclude possible AID assistance to regions of these countries in which oncho is found, provided that additional reasons can be found to justify AID intervention.

The DAP team believes that the south-west corners of Niger (the Say Arrondissement) is such a region. While at least two zones in this region are uninhabited due to oncho or a combination of oncho and trypanosomiasis, a major resettlement project is not recommended due in part to the distance between the region and potential emmigration areas. The government hopes to encourage colonization of these areas with up to 150,000 families who now live in marginal zones (300mm or less) north of the old French "limit to cultivation" in the Niamey

Department. If sociological studies indicate that colonization of these zones is socially and economically feasible, AID should consider financial assistance in ways that would encourage colonization but which would also be part of an economic development program program for the Say region as a whole. Such assistance might include programs for rural road construction or the provision of credit. This area has in the past been almost totally ignored by government and donor development programs despite its relatively fertile soil, Niger's highest rainfall (1600-750mm), and its proximity to the Niamey consumer market. At the urging of the Niamey ADO, a comprehensive development plan has recently been prepared for the region. There is considerable development potential in areas of the arrondissement which are presently inhabited where cereal production could be increased through the introduction of animal traction, improved farming practices and improved seed. A number of additional development activities - bas-fonds development, introduction of new crops, rational exploitation and marketing of fire-wood from tiger-bush areas for provision to Niamey with concomitant reforestation, increased milk production and marketing, small ruminant production, etc. - could be initiated in selected areas of the Say region.

The government of Niger has expressed its displeasure with integrated area development projects as proposed by several other donors. The DAP team believes the area lends itself well to small area-specific (village or groups of villages) or goal-specific (bas-fonds development, exploitation of tiger-bush, small ruminant production) projects which could constitute less threatening alternatives to an integrated rural development project. AID should support such activities in the Say area through a combination of small Voluntary Agency projects (CRS is planning a new project in the area) and AID projects (e.g., a small ruminant project, bas-fonds development project). These activities could be complemented by region-wide programs, such as a much needed rural road construction project which could be designed to facilitate colonization in the oncho-free pockets if colonization is proved feasible by detailed sociological surveys.

Dahomey

The DAP team does not believe that new development activities in northern Dahomey can be justified on the basis of onchocerciasis control. However, activities that AID may wish to undertake in the Atakora region of Dahomey (see Ag Sector analysis - Dahomey) should take the results of oncho control into consideration in project design and development.

Mali

The DAP team officer responsible for the onchocerciasis economic development analysis did not visit Mali. However, based on the FAO/SEDES report, it appears clear that AID should consider development activities in the oncho-free zones of Mali only if those projects can be justified on grounds other than onchocerciasis.

Regional Activities

Development activities which will be initiated in each of the participating African countries as a result of the oncho vector control program will certainly have repercussion between those countries. Coordination is especially necessary between Upper Volta and Ghana since oncho development zones in those countries are contiguous (White/Red Volta - North East Ghana). While the Economic Development Unit, located at Ouagadougou as part of the vector control program, has been given the task of coordinating economic development activities in these countries, special attention must be given to hydrological issues which have already begun to surface in relation to water control projects which will affect water flow in the Volta River Basin.

In the mid -1960's, Ghana constructed the Akosombo Dam on the Volta River in southern Ghana. The dam supplies hydroelectric power to Ghana and several neighboring countries. Ghana plans to build a second $100m dam (the Kning Dam) down-stream of Akosombo to further exploit the river's power. Ghana is also considering a third dam on the Black Volta in northeastern Ghana (the Bui Dam).

Meanwhile, within the context of development activities made possible because of the control of oncho, the government of Upper Volta is studying the feasibility of constructing dams on the Black and White Volta Rivers for irrigation and hydroelectric generation. Also, Togo is considering major water works on rivers in northern Tago which are tributaries of the Volta River system.

Ghana is legitimately concerned that these new projects (especially irrigation projects) upstream may significantly decrease the flow of the Volta River at Akosombo and Kpong and may decrease the generation of hydroelectric current at those sites. On the other hand, Upper Volta and Togo hope to take advantage of the availability of donor funds associated with the oncho-free economic development activities to exploit the Volta River system for their own benefit.

In order to resolve disputes over water use, establish water rights agreements, and ensure that donor funds are not used at cross purposes, it seems clear that a Volta River Basin coordinating mechanism must be established.

The thinly staffed Economic Development Unit at Ouagadougou is not charged with dealing with these major problems. An appropriate institution to deal with these hydrological problems might be an International Volta Basin Commission, composed of the riparian states of the Volta River system. Such an organization was reportedly proposed by UNDP in 1972. Although Ghana responded positively to the proposal, the organization was never created. AID should encourage the UNDP and associated members of the oncho program steering committee to resubmit a proposal for creation of a Volta River Basin Commission to the riparian states for their consideration. AID and other donors associated with the Oncho Vector Control and Economic Development Programs should agree that they will fund major water control projects in the Volta Basin only after full consultation between upstream and downstream countries takes place and assurances are made that such projects are acceptable to all countries affected directly or indirectly. AID and other donors should also plan to provide technical and financial assistance to help in creating, staffing and funding such an organizational during its early critical years of operation.

III. Modes of AID Assistance

While the DAP team recommends that AID participate in a major way in the economic development of oncho-free zones, in close cooperation with other donors, AID should structure its assistance in ways that minimize the administrative burden of project design and implementation across the seven state region. To this end, three modes of assistance are suggested and are described below.

1. Participation in a Multi-Donor Planning Fund

Although UNDP has set aside $500,000 per participating country to assist in carrying basic studies essential for careful planning of economic development activities in the oncho-free zones (hydrogeological, pedological, socio-economic studies, aerial photography and mapping), these funds may not be sufficient to complete the proposed tasks. In addition, IBRD development experts feel that the above studies should be supplemented by other, more sophisticated planning activities. IBRD, UNDP, FAO and WHO (the Program Steering Committee) are presently discussing a common approach to basic economic development planning in the oncho-free areas. Out of these discussions may emerge a scheme to establish a multi-donor planning fund which would be executed by the IBRD or FAO. This scheme, which would provide monies for basic planning and project feasibility studies in the oncho areas, might require funding beyond the level presently provided by UNDP. Should a multi-donor fund be proposed, it would be in AID's interest to provide a portion of the required monies since it would ensure a uniformly high degree of planning across the project area without requiring

major AID administrative effort. A precondition to AID participation would be AID review and approval of the model terms of reference for the series of studies which would be carried out in each of the participating countries. At this time no funding level can be recommended, although AID should consider providing up to 15% of funds required over and above the UNDP allocation.

2. An AID Regional Onchocerciasis Area Planning Project

As a strong proponent of early, high quality planning for the economic development of oncho-free areas, AID should be prepared to provide direct technical assistance for project planning, final design, special studies, etc., to participating African governments. The magnitude of such direct assistance will depend on whether the multi-national planning fund discussed above is created, but some assistance would be necessary in any case.

This regional project would be administered by an AID officer in Ouagadougou working in close collaboration with the oncho-program Economic Development Unit. The project should be flexibly designed in order to respond quickly to requests for the following kinds of technical assistance:

a) short-term advisory assistance to government organizations charged with planning economic development activities in the oncho-free zones. Such short-term assistance would probably be requested in technical areas were U.S. expertise is highly respected (range management, water resource development, arid land development, applied anthropology and regional planning).

b) long-term technical assistance will probably be requested by those governments which foresee a major AID role in the development of a specific geographical area (e.g. Eastern ORD, Upper Volta, northeast Ghana) or for initial staffing of the proposed Volta Basin Commission.

c) special studies related to specific project zones or research problems which affect all or most of the oncho-free development zones. These studies might include some of the following topics:

- sociological problems associated with colonization schemes
- the incidence of trypanosomiasis in oncho-free areas

- transport options for development of oncho-free zones

- attitude towards migration to settlement zones

- the control of bilharzia in oncho settlement zones

- problems associated with transferal of local leadership to colonization areas

- cost-effective health delivery systems for colonization areas

- the need for support facilities in rural development project areas

- non-formal education options for oncho-zones

d) Seminars - Seminars could be structured on subjects that particularly interest planning officials dealing with oncho-free zones in the participating countries. Such activities would facilitate the transfer of relevant experience regarding resettlement or colonization projects between participating countries and from outside the program area.

3. Capital Assistance

The bulk of AID assistance to the oncho-free areas will be capital assistance transferred by loan or by grant. Due to the preliminary stage of oncho-zone planning in all of the participating countries, it is very difficult to suggest at this time what form these capital resource transfers should take. While capital transfers must be designed on a case-by-case basis, capital transfer models designed for one country may be transferable with minor modifications to other countries. At this time we foresee three project-types which should be considered for the transfer of capital resources to make oncho-free zones. Each would provide an input essential for the balanced development of the oncho zones. The first would provide funds for rural road construction or other modalities of transport* to encourage settlement and the marketing of surplus crops. The second would provide short

*Preliminary analysis indicates that other forms of transport, such as light aircraft and animal transport, should be considered as transport options during certain stages of development of these zones (see transport analysis, Section G following).

and medium-term agricultural credit at reasonable interest rates to settlers in the oncho-free zones. The third, which might be called an Oncho-Area Infrastructure Development Fund, would consist of a fund which could be used to purchase equipment and cover capital costs of social and economic infrastructure (schools, dispensaries, markets, etc.) in new settlements in the oncho areas. These facilities would be constructed only after a request had been received for such a facility or facilities from settlers in a new area. The settlers would be responsible for supplying most of the unskilled labor required for construction of the facilities possibly with reinbursement in food (World Food Program) and limited wages. This approval would encourage self-reliance and would ensure that social infrastructure would be placed in locations where it would be best utilized.

Tentative gross estimates of capital transfers by country over the next 15 years are as follows (based upon criteria described above).

	Loans	Grants
Upper Volta	$10,000,000	$7,000,000
Ghana	10,000,000	-
Togo	3,000,000	-
Ivory Coast	3,000,000	-
Dahomey	-	-
Niger	-	2,000,000
Mali	-	-
TOTAL	$26,000,000	$9,000,000

G. Transport (Regional Programs)

We recommend a transportation policy which will have the twin objectives of facilitating relief measures and promoting the rehabilitation of the agricultural economy of the Sahelian countries.

Various studies have emphasized the essential role of the transportation sector in promoting agricultural growth, particularly in the regional context for landlocked countries and regions.* Given the importance of agriculture in each economy as well as the extreme poverty of the majority of populations, there is no aspect of transportation which does not have a very direct impact on standards of living in the CWR area.

Given the probable budgetary, economic and organizational constraints of the next five years, we recommend a transport policy which emphasizes improvements in productivity and efficiency, with the aim of lowering transport costs and improving the service of transportation to the farm population.

While we believe that all of the policy components we recommend support the major objectives of AID policy and are a timely response to the present Sahelian crisis, some recommendations (Nos. 1, 2, 3, 4, 5, 6, 7, 10) are specifically designed to further the self-reliance of the Sahelian countries, some (Nos. 2, 5, 6) to promote African enterprise, and some (Nos. 2, 7) will have a direct impact on the small farmer.

Taken as a whole, the components which support the recommended policy recognize the regional interdependence of the area, the interrelation of the various modes of transport, as well as existing political, economic and social constraints and the roles of donor agencies and African institutions. The policy builds on the transport structure which has already been created in the CWR region, rather than introducing extraneous elements.

For each component, we discuss the function it will fulfill, its justification for inclusion, and the Sahelian region to which it applies.

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*See Central Africa Transport, Africa Bureau, February 1973; Sahel Transportation Analysis, Louis Berger International, Inc. November 1974; The Transport Sector in Senegal, Mali & Mauritania, Africa Bureau, December 1974.

The problems of transportation and communication, along with the nationalistic influences of West African states, have served to limit the performance of regional organizations in the fields of training, especially at the intermediate level. Therefore, it may be more effective to develop small training programs within each country which are oriented to its problems and responsive to its needs. An example of this effort is exhibited by a UNICEF proposal to establish a garage for vehicle maintenance and training in Mauritania, with a request for AID financing. Such programs appear advantageous, and a joint action by donor organizations may be necessary to ensure a sustained performance.

Apart from their role as social integrators, feeder roads can play a significant role in increased agricultural production and can help accelerate the transition of farmer's activities from the largely subsistence type into market-oriented production. To the farmer, this increased access to market at significantly lower transport costs can provide the incentive to utilize agricultural technology such as animal traction and insect control and thereby achieve larger production and more revenues. Therefore, the economic benefits accrued to the economy from feeder roads are developmental in nature: increased production, as well as reduced transport costs. It must be realized, however, that a feeder road program must be integrated into a program of agricultural development. Unless extension services, pesticides, and other means of production are provided to the farmers to help increase productivity, feeder roads will not be of much significance.

Furthermore, feeder roads require continuous maintenance efforts at costs ranging from 30-50 percent of their annual capital costs. The nature of these roads and their remote locations make it difficult for the national public works department to be able to maintain them. There is, therefore, the need to support programs to create local brigades for the maintenance and upkeep of these roads, and to convince farmers to participate in such programs. Labor-intensive techniques as well as local materials can prove effective in such efforts.

Mali has started such programs for the peanut and cotton areas, supported by the World Bank and the French Technical Assistance (FAC). Such a program must be strengthened and extended to other food crops. In Senegal as well as Mali and Mauritania, such programs can be integrated with such programs as the OMVS (Organization pour la Mise en Valeur du Fleuve Senegal), especially with the new programs involving the Manantali and the Delta dams. A well planned feeder road network can prove most effective in maximizing the returns on investments in river perimeter developments which both AID and other donor organizations are planning in the region.

POLICY COMPONENTS

We have selected ten policy components which are most likely to promote the desired objectives and discussed them in order of importance. They represent programs and projects to be implemented, not necessarily by AID, but perhaps with the agency sharing in the formulation of transport policy.

1. Highway Maintenance and Upgrading

In our view, the first priority should be given to strengthening the ability of the Sahelian countries to maintain and upgrade existing national highways, the major arteries for carrying farm produce to market. National highway maintenance and upgrading are the responsibility of the national Ministries of Public Works. We have bracketed maintenance and upgrading because in practice they are interrelated.

This view contrasts with that of other authorities who continue to advocate new construction of major highways as the primary form of transport assistance to the Sahel, a position which we consider unrealistic and counterproductive. We note, on the other hand, that the European Development Fund, after promoting major highway construction in the Sahel, is beginning to allocate a larger proportion of funds to maintenance.

The objective of this proposal is to provide more reliable and lower-cost year-round transportation routes which are relatively heavily travelled and where rail transportation is not available.

It is justified on several grounds. It will bring more benefits to rural populations, in moving both the inputs necessary for agriculture and the outputs which provide revenue. It makes use of existing structures. The ability of the various Ministries of Public Works to carry out maintenance has been gradually improved since Independence, and the techniques for assisting them have been developed and applied. Nevertheless, an increased effort is required. Public Works representatives have said that the current inflation has been even more harmful to the economy than the drought. This is a strong statement, but reflects the budgetary restraints which prevent them from doing the routine maintenance which would permit the normal flow of traffic.

Even without the impact of inflation, the national budgets are insufficient to finance the work on national highways allocated to Public Works, so that the highway network in the Sahel is gradually deteriorating. In addition, the process of building up the

road maintenance departments has been difficult, and the productivity of existing departments is only gradually being raised. Much higher output can be obtained from existing staff and equipment through improved organization and incentives.

Our field research determined that the process of providing technical assistance to Public Works is long-term. Without exception, the road maintenance departments of the Sahelian countries will require continuing support during the period under consideration. At the top level, there is a constant attrition of the best African civil engineers into other occupations. On all levels, the creation of a professional attitude is a slow process. The extension of road networks enlarges the scope of responsibility. Even where (as in the case of Upper Volta) the stock of equipment is currently adequate, there is no provision for its replacement.

It is therefore necessary to continue to provide technical assistance and perhaps to augment it, to fund equipment replacement and, in exceptional cases, to assist in financing operating expenses to offset inflation.

This policy aspect applies to all Sahelian countries and to those regions of their coastal neighbors where rail transport is not available.

We believe that a major improvement in productivity would take place if road maintenance were taken out of its civil service context and made an autonomous agency which would reflect its dynamic role in nation-building. We also suggest that encouraging the creation of a regional public works agency, where international roads are concerned, could lead to more productive use of manpower and equipment. Entities such as the Conseil de l'Entente, the Organization of Riparian States and the Transequatorial Communications Agency might provide the suitable framework.

In terms of road maintenance training, an international effort was mounted to establish a regional road maintenance center in Lomé, Togo a few years ago. Currently, this center is managed by Philco-Ford, with the objective of training technicians on road maintenance throughout West Africa. This effort has yet to be successful, due to a combination of management and political problems. Another small-scale road maintenance center is located near Abidjan in the Ivory Coast, but its performance has not yet been evaluated.

Rural Road Maintenance

The maintenance and upgrading of rural roads is also important to the agricultural economy of the Sahel, but must be viewed from a different perspective than the maintenance of national highways. The poor soil of the Sahelian region has imposed a network of small, isolated villages over wide areas, even where population densities are relatively high in the zones of comparatively high rainfall. The amount of agricultural surplus over and above subsistence needs is small and fluctuating, but often vital to the village and national economy.

Rural road maintenance is the responsibility of local authorities, who face organizational and budgetary problems. The result is high transport costs to the detriment of the farmer. The problem of rural road maintenance has not found a satisfactory solution; the problem itself has only recently been recognized and defined.

In proposing a tentative solution, we distinguish between two types of rural road. One is the relatively long artery, built to low construction standards, carrying a low volume of traffic and seasonally impassable. The other is the village road, connecting the villagers with their fields and one village to another within a radius of 10-20 kilometres.

One partial solution which is currently applied to the Sahel is the inclusion of rural road maintenance in specific development projects, at a relatively high cost and requiring relatively high technology inputs. This is most effective in such projects as the cotton development in western Upper Volta, where there is a quantifiable benefit to be measured against a predictable cost. It is likely to be less effective in other projects which are more gradual, and have social rather than economic objectives. In general, rural roads, whether for areas of existing farm production or for new settlement areas, are a prerequisite for development but cannot pay their way.

The function of this proposal is to explore new approaches, recognizing that they may be imperfect solutions. Regarding rural arteries, the first step would be to build up the capacity of the Ministries of Public Works to provide engineering standards and supervision for the rural arteries now under local authorities, with new development schemes to be fitted into overall priorities. Secondly, emphasis should be placed on encouraging the formation of indigenous construction companies rather than employing expatriate construction firms, although local firms may -- as is sometimes the case -- employ some expatriate cadres. They should be encouraged to combine capital-intensive and labor-intensive methods, with a view of conserving foreign exchange and absorbing unemployment. This assumes at least seasonal under-utilization of local resources and probably implies budgetary support and regional or international mobility of labor.

The emphasis of village roads should be on labor-intensive methods. It has been noted that Africa villagers tend to develop more responsibility for pistes which they have built than for those which are built by outside help.

This approach assumes that work organization can be provided through village social structures, with only modest outside inputs of equipment and technical advice.

3. Railroad Development

The petroleum crisis has reversed the previous relationship between road and rail, which tended to favor the growth of truck transport for bulk transport at the expense of the railways in West Africa. Fortunately, West African authorities, in some cases, have already anticipated this change, as demonstrated by the continuing improvement of the RAN and the Transcam projects, as well as investments in the Senegalese and Malian rail systems and the prospect that mining projects in Togo may justify the re-equipment of the Togolese rail system. Without exception, the economies of the Sahelian countries will continue to be dependent on their rail connections to the sea. Rail transportation for the Sahelian countries is a regional rather than a national problem.

Over the next five years, transport policy should aim at reducing rail transport costs, improving efficiency and reconciling rail and highway transportation.

The priority aspect of a railway improvement program is management and operating efficiency. This requires additional technical assistance, analogous to our proposal for national highway maintenance. It may also imply structural reform, for which we suggest two possible programs for study. One program would consist of encouragement of autonomous Railway Authorities embracing all railways connecting inland countries with seaports: autonomous in the sense that encouragement should be given to viewing railways as profit-making enterprises rather than government bodies, a view which could extend to transforming railways into mixed companies, with an infusion of private capital and management.

In spite of the new economic status of railways, they are unlikely to be profitable (and hence efficient) unless they carry at least 500,000 tons of freight a year which, in the Sahelian context, may be obtainable only through mineral traffic. This limits the prospects for many of the railways, but opens new possibilities in the

Entente region. We believe that insufficient attention has been given to alternatives for the evacuation of minerals from the Tambao region. Rather than linking the extension of the RAN from Ouagadougou to Tambao solely with the port of Abidjan, it might be feasible to offer an alternate and viable route by extending the Togolese railway from Blitta to Ouagadougou and perhaps even linking this with the OCDN at Parakou. A unified system would permit interchange of personnel and rolling stock. If such an extension proved feasible, economic advantages might dispell political objections.

4. Port Development

As the drought emergency demonstrated, West African seaports, although mostly outside the Sahelian countries themselves, played a vital role in relief. They are equally essential to the rehabilitation of the Sahelian economies.

As with railways, the ports are a major element of the transportation system. The purpose of this policy component would be to lower their costs and improve efficiency, thus increasing the share of market price for exports to the producers themselves.

This is, in turn, the justification for treating the seaports as if they were located in the Sahelian countries.

Port management, under the scrutiny of drought relief systems studies, has revealed itself to be inadequate. It is true that the individual ports were not developed with a view to anticipating the emergency, but their failure in this respect is also a failure in providing for normal economic needs.

The development of effective port authorities is, at best, a gradual process, and in the case of West Africa has been hindered by national rivalries. It was once proposed, for example, to construct a joint port for Togo and Dahomey. Port development has, in practice, been uncoordinated and has tended, until recently, to slight the landlocked countries in favor of the country in which the port was located. The most successful example of port development in the region has been Abidjan, favored by a relatively prosperous hinterland, as well as providing transit traffic for Upper Volta and Mali.

The aggregate volume of traffic of the ports serving the Sahel is relatively small by international standards. This would argue that the first step in improving their efficiency might be the creation of a supra-national port authority which would coordinate investment and exchange management personnel and practices. There is

continuing need for technical assistance, hand-in-hand with the process of Africanization, itself a desirable trend. It is essential that the rapid improvement in port handling techniques around the world be absorbed as rapidly as possible by the ports serving the Sahel. At the same time, it is essential to avoid duplication of investments.

5. Private Trucking Management

In dealing with transport policy in the Sahelian context, emphasis is too often given to road construction and maintenance, without any consideration of the users -- the trucking industry itself and its corollary, passenger transport. Yet, logically speaking, the best roads in the world will not lower transport costs or improve efficiency unless the user themselves improve in parallel fashion. The private trucking industry in the Sahelian region is largely an unknown factor in transport policy formation. Its importance and its shortcomings have been appreciated in the drought emergency, in which it plays an essential role. Its role in economic rehabilitation will be equally significant.

Little is known about trucking costs and efficiency because the truckers guard this information closely. Trucking is an outstanding example of African private enterprise. It has grown spontaneously in the face of expatriate competition favored by access to outside capital and management, and despite obstacles imposed by government policy and practice. Among these obstacles are poor roads, barriers at international frontiers, and unwise taxation.* In addition, African truckers have had to improvise their own management practices, face difficulties in obtaining capital and have had to rely on inadequate service facilities. Furthermore, seasonality handicaps profitable operations.

We have noted that the Conseil de l'Entente may have made more progress than is generally realized in removing some obstacles to the efficient movement of goods by road across international boundaries. There has been a gradual improvement of many roads. African truckers probably have better access to capital than was the case a few years ago and, at least in some areas, we were reliably informed that management practices are showing a sharp improvement.

There is clearly an opportunity to provide technical assistance to all phases of trucking management and operations. Encouragement could be given to the disclosure of trucking companies' operating costs. The competitive nature of trucking makes it likely that savings from increased efficiency would be passed on to the users, who to a large extent are the farmers themselves. This could be an important element in stimulating the output of cash crops for market.

*Taxation policy may account for the higher costs of trucking operations in the Sahelian countries as compared to the coastal countries. Trucks should be recognized as capital equipment and treated accordingly in government policy.

6. African Repair Shops

Vehicle repairs are almost certainly an element of transportation cost which could be sharply reduced. There are several reasons for these high costs. Import policy has encourage a wider variety of models than is necessary to meet user needs, each with its own parts and service requirements. Many service facilities have high labor costs for expatriate personnel, so that the advantages of better training and management are not passed on to users. African repair facilities, on the other hand, only exceptionally have access to the factors of production which enable them to operate efficiently at low cost.* There is great scope for promoting the desirable objective of expanding the African sector of vehicle repair and thereby lowering transportation costs.

In preparing this report, we have been impressed by the approach taken by the UNIDO/OPEI African enterprises project in the Ivory Coast, and propose that aspects of this project serve as a basic model for each of the Sahelian countries. The project covers a range of small businesses, of which vehicle repair is only one.

In each of the Sahelian countries we visted, there is an indigenous organization similar to the OPEI. While they are in various stages of formation, they could serve as a framework for encouraging vehicle repair. The project would make a census of vehicle repair establishments, ascertaining their present number and location, their distribution between African and expatriate management, and the quality of their operations. Starting with this data, a program can be established to reach the desired objective within a specified period of time. The elements of the program would include management, mechanical training, equipment and inventory and credit.

7. Animal Transport

Animal transport is another neglected element of transport policy. Yet it is the aspect which might contribute most directly to raising the income of the poorest section of the population of the

*One example of this is found in the June 30, 1974 quarterly progress report on the promotion of African enterprises which cites a loan to a garage operation in Niamey. After 12 years' experience, including factory training in France, one individual opened his own garage which he hopes to expand to provide tire recapping and battery rebuilding.

Sahelian countries. The beast of burden -- whether camel, horse, mule or donkey -- is an all-purpose, all-weather off-the-road vehicle, requiring little or no foreign exchange, repair costs, infrastructure; with low capital costs, reasonable depreciation, impervious to the petroleum crisis and offering useful byproducts.

Thematically speaking, animal transport represents an amalgamation of the livestock and transportation sectors; and in outlining policy, we propose to treat it as such.

In historical perspective, the Sahelian countries appear to be in the process of losing a once-great tradition of animal transport. Within living memory, such peoples as the Hausa and Mossi were famous as horsemen, while Kano and Timbuktu were ports from which caravans set out to cross the Sahara -- obviously economically because these cities were known for their wealth. The camel is still seen in Niamey, and donkeys carrying firewood to Ouagadougou are a familiar sight. It is necessary, on one hand, to avoid romanticising animal transport and, on the other, to avoid misapplying the economics of a capital-intensive society and reaching erroneous conclusions.

We believe that there is a proper role for encouraging animal transport in the Sahel which comes under transport policy. This role is played out in two forms. The first is in the transport of small volumes of goods across long distances, where both infrastructure and vehicle operating costs are prohibitive -- and where time is not a vital factor. The second is in transportation within a limited radius around small villages which have only a small marketable surplus. The starting point is livestock management. Is it possible to encourage production of transport animals within the constraints of sanitary conditions, cultural practices and availability of feed? We believe that it is.

Throughout much of the Sahel, technical assistance in breeding and veterinary medicine can offset the problems of disease for transport animals, perhaps to a greater extent than for cattle. Animals cannot be raised in areas where population density is already too great for the soil to support, but there are probably areas where animal raising would be an incentive to greater productivity in farming.

While in most areas, vehicle transport costs can be shown to be lower than for animals, the Sahelian area may well be an exception. If transport animals can be raised with little or no monetary cost to the farmer, and if his village generates a small marketable surplus but is isolated from easy access (particularly during part of the year) from truck transport, the net income of the village may be increased by the availability of animal transport.

This is particularly likely if, as is the actual case, there is virtually no provision for low-cost roads to the village. Here the animal or the animal-plus-cart is economic, particularly since in a subsistence economy there are family members available at no wage cost to go to market.

In urban transportation, considering the small size of cities in the Sahel, it may be feasible and economic to encourage the phasing out of some gasoline-powered taxis in favor of horse-drawn carriages, within the context of assistance to small business.

Lastly, if it became possible to introduce animal transport on a broad scale in the Sahelian countries, animal transport would also become available for use in some development projects, as is not uncommon in other parts of the world. The horse, for example, offers clear-cut advantages in flexibility and reliability over gasoline-driven vehicles under a range of conditions -- and even more so as a supplement to vehicles -- where climate permits.

It is apparent that encouragement of animal transport would be an alternative to the almost insurmountable problem of providing an adequate system of rural roads, and that its real economic value can only be determined under conditions of actual utilization.

8. Light Aircraft

The use of light aircraft represents a limited case of special utilization in development projects. As in the case of animal transport, it can be seen as a form of trade-off against the cost and organizational difficulties of constructing rural roads. Particularly at the outset of a rural development project, before there is economic justification for piste construction, light aircraft may be able to play a role in connection with other forms of transport.

To make it effective, a study would be necessary to integrate flying hours into a variety of situations. The Sahelian countries already generally have a nucleus of light aircraft operations, many of which are relatively high-cost and under-utilized due to lack of planning. Light aircraft could be integrated into development projects (much as the cost of vehicles and other equipment is provided for) for inspecting projects instead of using cars. Light aircraft can be used as well for carrying seeds, medicines, educational materials and spare parts.

This proposal is no more than the suggestion that in planning development projects in the Sahel -- where atmospheric conditions for flying are better than in many parts of the world -- there may be a conceptual bias in favor of road vehicles, however inappropriate they may be to the terrain.

9. Transport Information

There is need for centralizing information on transportation in a single donor information center. Since Independence, the volume of freight has increased and the transportation system has become complex. A large amount of research has been done. Such information as has been retained over the years is widely dispersed and fragmented.

It would appear that a transportation information center would facilitate planning among donors and would improve decision-making.

The proposed center could be staffed by a small group of engineers and economists who would be permanently responsible for disseminating regional transport information and who would be supported by archives. Initially, this center might cover the Sahelian region, including its coastal links.

10. Transportation Institutes

There is also a need for the creation of regional transportation institutes, located in West Africa, which would be part of a regional entity and which would serve as documentation centers, management centers, conference centers, sponsors of small-scale field research and liaison with national entities in planning, railroads, ports, trucking and public works.

Unlike the proposed information center, which would be primarily designed to improve donor coordination, the institutes would work primarily with the host countries.

One of the findings of the DAP exercise is that political decision-making in the field of transportation is handicapped by lack of reliable and objective information in the hands of decision-makers. Some decisions merely reflect special pleading by interest groups in the absence of alternatives, or are simply postponed for lack of information. The existence of the institutes might also encourage the shift of benefits resulting from improved transportation to the rural population, rather than to the special interest groups.

Under West African conditions, a large regional institute would tend to lose the intimate working relationships which are necessary for success. Therefore, consideration might be given to the establishment of three such groups; one attached to the Organization of Riparian States, one attached to the Conseil de l'Entente, and one attached to the Transequatorial Communications Agency. The three institutes could also facilitate exchange of views among the three organizations.

H. Liptako - Gourma Authority

The Liptako-Gourma Authority was created December 3, 1970 to promote under a three country (Upper Volta, Niger, Mali) regional structure, the development of mining, energy and the hydraulic, agricultural, pastoral, and piscicultural resources of the region denominated Liptako-Gourma. This region (470,000 km^2) consists of a quasi-rectangle crossed diagonally NW-SE by the Niger River and including western Niger, the Gao-Timbuktu region of Mali and the eastern half of Upper Volta (east of a line from Po through Ouagadougou to Timbuktu). The organization has primarily been interested in the exploitation of the region's mineral resources, and in the transport links between the major states, such as the Fada N'Gourma-Niamey Highway. The Liptako Gourma Authority headquarters is in Ouagadougou and is staffed by three African professionals and one full time Canadian advisor. Despite the recent incarceration of its former director, the organization still appears to receive a modicum of political support from the governments of Upper Volta and Niger* and is now led by an aggressive new director.

The Authority sees its role as planning and designing development projects which affect at least two of the member states, and coordinating requests for donor assistance for these projects or others which may be proposed for the Liptako-Gourma region by the individual member states. Member government technicians review the Liptako-Gourma drafted proposals before they are submitted to donors. The authority does not use its staff to carry out feasibility studies but administers contracts for such work using donor or member government funds. Funded projects are carried out within the existing structures of the appropriate technical services of the member states.

The first priority of the Authority at present is soliciting private investment and donor monies for exploitation of manganese and other mineral deposits discovered at Tambao, Ansongo and other sites in the Liptako-Gourma region. A complementary goal is to obtain funds for extension of the Abidjan-Ouaga railroad from Ouagadougou to Tambao and eventually to Ansonga; and construction of a rail spur to Dori and Niamey.

Transport priorities include paving of the Fada-Niamey and Fadda-Pama-Dahomey and Tillaberry-Gao roads and development of a secondary road system in the Liptako-Gourma region.

Liptako-Gourma Authority officials also feel they can design projects for AID funding consideration within the four AID priority sectors (agriculture, livestock, human resources development, and health/population). Examples cited were: 1) public health - construction of three regional hospitals (Dori, Niamey and Gao); construction of dispensaries; development of a mobile health team program for Liptako-Gourma, 2) Population - special

*Opinion of Mali government not known by DAP team.

work in the Liptako Gourma area in connection with the 1975 UN-funded Census; 3) Livestock - cattle trails, vaccination campaigns.

AID has, in the past, entertained requests for assistance submitted by the Liptako-Gourma Authority, but has in each case, to the Authority's dismay, eventually turned down the request. The Ambassador in Upper Volta, the Acting-RDO in Niamey and the DAP team all have serious reservations about the value of AID support to such a marginal regional organization.

With few exceptions Liptako-Gourma proposals which are truly regional in nature are found in the transport or mining sectors and are of little AID interest. Most other project ideas which the Liptako-Gourma has put forward are hardly credible as regional projects (e.g., regional hospitals) or are activities that could probably be carried out with greater long-term benefits on a bilateral basis - for example, through the eastern ORD administrative structure. AID should seriously consider only those Liptako-Gourma proposals 1) which are of a small, innovative nature, testing the validity of program ideas which governments are not yet willing to examine on a bilateral basis; and 2) which if successful could potentially be duplicated by Liptako-Gourma member governments on a broader basis.

III. BILATERAL PROGRAMMATIC CONCLUSIONS

A. SENEGAL

Senegal, as indicated in the contry analysis in part III, is a country with significant potential, perhaps the only Sahelian country with the potential of becoming a self-sustaining "graduate" of concessional assistance in 20 years. Senegal has one of the highest per capita incomes in the area, $285, but the gross imbalances between urban and rural sectors ($550 vs $100 per capita GDP) indicate the enormous distance to be traveled to achieve national participation in a development framework. Major problems exist at the national level as well: chronic balance of payments difficulties aggravated by annual imports of grain of more than 350,000 MT, a high level of administrative and other current account expenses that strictly limits domestic resources for investment, shortages of managerial and planning skills particularly at the project and program level, and a high cost education system that reaches a maximum of 40% of those eligible at the elementary level.

Senegal, however, has a significant role to play in the economy of the region. Much of the benefit from the proposed Senegal River Basin development falls in Senegal, i.e., 60% of the irrigable land. Senegal's agriculture is more commercialized than its neighbors, with 40% of the farmers growing some portion of their crops specifically for sale. There is a surge of Africanization in every aspect of the economy: research, extension, rural education. The administrative structures are in place for development of each region of the country. There are enterprising ideas being developed in rural education. And there is evidence of recognition and increasing action on important policy issues such as raising farm-gate prices to encourage both food and export crop production. In sum, things can happen in Senegal, perhaps faster than in many of the other countries in the region.

The principal issues for AID will be self-help criteria and the availability of Senegalese staff. Despite the structural and historical explanations, the relatively high per capita income of Senegal against the relatively low level of domestic resources for agricultural and other development programs -- such that even local operating costs of development programs must be partially met by donors -- will raise questions. Over half of Senegal's Four Year Investment Plan is being sought from external resources, including nearly 2/3rds of the agricultural program and 5/6ths of that for livestock. Administrative organizations as well established as SODEVA, in the groundnut basin, are so dependent on external aid that if a donor-financed project ends, a large part of the staff may be dismissed. As restaff for Senegalese must be tempered by the need to increase vastly in the Senegal River Basin, or the Casamance, and still keep Senegalese in the forefront, will be a question for careful scrutiny.

On balance, the DAP recommends a significant AID involvement in Senegal. The potential for Senegal itself, for reducing the drain on world food supplies, and for the Senegal basin as a whole, is too great to be missed. In the course of that involvement, AID should join with other donors in urging the GOS to find ways to reallocate more funds to development investment. Initially, however, AID projects will have to be on quite concessional terms, including a substantial grant element, and should cover some portion of local costs. (The 25% rule, however, should not be breached after the drought.) Each major sector program should include an element of consultation with the GOS on how more local funds can be captured for the costs of the programs and, as in the OMVS' own plans for the basin, there should be planning in each of the productive sectors for how proceeds from development can be recaptured for further investment.

1. Agriculture

a. Senegal River Delta. The GOS is further advanced than the other states of the basin in organizing for exploitation of irrigation potential from the Senegal Basin Development program. Still, scarcely more than half the acreage scheduled for development in 1980 is currently being prepared. AID has indicated readiness to consider $15 million for such land preparation in FY 76 -- to include planning, design, training, land levelling, rural roads, irrigation, etc. Probably equal amounts could be spent in FY 77 and FY 78, especially if joint agriculture and livestock activities were included.

b. Casamance. Several projects (IBRD, FED, PRC), largely of a pilot nature, are pushing forward in developing a technological package and an organizing technique to tap the potential of this higher rainfall region. At present, low yields (1-2 MT/hectare), lack of price incentives for fertilizer purchase, and transportation problems keep the area from being a surplus producer of rice. With a new administrative structure expected for this region this year, and further progress by the other projects, area development programs in this region (transport, marketing, extension) seem desirable for FY 77 and beyond, perhaps at $10 million per year.

c. Research. Senegal is moving to bring the several agricultural research systems in the country under a coordinated structure, and to increase Senegal staff at all levels. Major gaps exist in Senegal research concerning the right package of inputs for small farmers, micro-level farm economics, and conservation needs. Technical assistance and training at all levels, with an accent on accelerating Senegal staffing and utilization of the research system, is recommended. A study of Senegal and other country agriculture research needs is recommended in FY 76, with major program inputs to being in FY 77.

d. Millet and vegetable production in groundnut basin. The FY 75 AID project with SODEVA should provide valuable experience and precedents for increasing food production in the groundnut basin and for preserving the productivity of the region. The sight of areas in this vital region being abandoned because of soil depletion is a warning of the catastrophic effects that could occur from failure to institute a major conservation program as part of the agricultural activity in the basin. Expansion of the AID program in FY 77 or FY 78 would seem well warranted if it could contribute to this end.

2. Livestock

a. Agriculture - livestock efforts. Senegal policy regarding livestock development is less complete than government policy regarding crop production. Techniques of range management and water usage are not well advanced. For this reason, rather than engaging directly in exclusive livestock programs in the sylvano-pastoral region, AID might more usefully work on mixed agriculture-livestock programs along the Senegal River. This would allow for enhancing Senegalese experience in land-use planning, water management and commercialization. It would also be a natural direction for expansion of the AID livestock project at Bakel, which was funded in FY 75, and the agricultural projects contemplated elsewhere on the Senegal River beginning in FY 76 or FY 77.

b. Planning and Training. AID should consider assistance in the field of range management at the national planning level, and the training of persons charged with the development of the sylvano-pastoral region.

3. Rural Education

a. Linking rural education to other development activities in the region. Beginning with the mid-term production projects, SODEVA and Bakel, AID representatives should work with Promotion Humaine and other elements of the newly strengthened rural education network to devise a program which supports and complements the production projects. Such a program may involve assistance to individual programs of Promotion Humaine, to Ecole Nationale d'Economie Applique, which trains rural education workers, or to the University. But the means of this collaboration should be enlarged mid-term projects in FY 76, not new and independent Rural Education projects. This is to promote a closer relationship between the newly coordinated rural education programs and the agricultural extension and development systems.

b. Technical assistance to the central apparatus. In the course of enlarging the mid-term project, AID representatives and Senegalese officials will become aware of specific ways in which Senegal's apparatus for rural education can be strengthened.

To the extent that remedies may be assisted under on-going AID programs (mid-term projects, PAID, Accelerated Rural Learning), or other donor programs, the necessary technical assistance, training, or materials may be provided without undue delay.

c. Long-term assistance, beginning in FY 77 or FY 78. As Senegal's rural education planning and implementation capability is thereby strengthened, AID should be prepared to consider funding for a long-term program in support of the rural education effort, addressing both planning and operational requirements and reaching larger areas of the country.

4. Health

a. Assistance in Health Planning. The health section of Senegal's Fourth Plan outlines an intelligent approach to developing a health delivery system. It provides for creating an infrastructure that would reach the rural masses, for training the needed personnel, for the creation of a supply system, for expanding transportation facilities and for obtaining external financing. However, in practice, the Government's efforts to implement the health plan are disorganized and disjointed and coordination of external assistance is practically non-existent. Yet, there exists in Senegal the institutions, experience, donor interest, and local potential to develop a truly national health delivery system. Work toward that goal, as a model for West Africa, seems worth concentrated effort. Therefore, the first and most important assistance AID could give to Senegal in the Health field would be to provide the services of a US health planner in FY 1976 (or late FY 75 if possible) to assist the Planning Group of the Ministry of Health in rationalizing the Health Plan. Since it is anticipated that this US planner could work on a regional basis, the scope of work and estimated cost of this activity have been described in the section on "Regional Recommendations." Some of the specific program recommendations that follow would be planned in detail under his direction during FY 76.

b. Support of a long-term rural health program in Senegal. The planning effort in Senegal should be aimed at developing a realistic plan for extending health services to the rural area. As in Tanzania, the plan should have strong indigenous support and leadership, and a consortium of donors should be organized to meet, in related fashion, the various external inputs required. If these conditions are met, AID should be prepared to make a sector grant or loan in support of the program. This is likely to be no earlier than FY 77.

c. Cooperation with UNICEF on "Women, Youth, Children" Project. Following a UNICEF-sponsored conference in Lomé in 1972, it was decided that a special effort should be made to improve the health and standard of living of women, youth and children. Goals set included, in addition to improving health, the distribution of clean water, the rural and agricultural education of youth with emphasis on truck gardening, and home economics with emphasis on transforming the way of life of young mothers and their children. In order to reach these goals in Senegal, a global program has been developed by UNICEF at a cost estimated at $4 million. UNICEF has already appropriated $200,000 per year for a 3-year period and is seeking the cooperation of other donors to complete the program. There is a possibility for AID input which should be explored, as an interim or complementary step toward support of a broader sectoral program and as a step toward donor coordination in national health programs.

d. Health Demands of Water Resources Development. Senegal's Fourth 5-year Plan provides for a series of relatively modest hydraulic projects along with the major irrigation schemes for the Senegal river. All of these introduce risk of enlarging the breeding of disease organisms and the spread of disease among new settlers. Assistance, as part of the agricultural projects, but also directly to Senegalese planning capacity, should be provided in prevention and control of these hazards. Measures to address this need are discussed more fully under the regional section on health and under the section on the Senegal River basin (OMVS).

B. MALI

Mali ranks as one of the poorest of developing countries. Its per capita GNP is less than $70 and its national budget less than $65 million, or less than $13 per person. There are self-help measures that Mali can take to improve its revenues and development budgeting, but basically the costs of development investment -- both external and local costs -- must be externally financed for some time to come. There is no other way to help in Mali.

Mali has long been thought of as the potential "bread basket" of West Africa. That dream fades as per capita food production declines and food imports rise to more than 1/3 of total imports. A critical question now facing Mali is whether, through over-grazing, lack of investment and other causes of land deterioration, its livestock potential will similarly decline. If Mali is poor, its potential for development and its importance to the region, are nevertheless significant. Mali supplies much of the cattle to the West Coast of Africa. It is relevant to the markets of the Entente, Senegal, Nigeria. It contains within its borders much of the basic resources of the Niger and Senegal Rivers. Mali is thus central to both the Senegal and Niger basin development programs. In the case of the Niger, both agriculture and power resources are concentrated in Mali; in the case of the Senegal, most of the power potential. The Malian people are independent, hard-working, energetic. Their capacity to plan, administer and implement programs ranks with any of the countries in the region and exceeds most.

Donors face several difficult issues in Mali. As noted, nearly all development costs must be externally financed. Even for the long-term, however, there is the question of whether markets exist to support the infrastructure needed to tap some of Mali's natural resources; can Mali hope to pay the prices eventually to farmers that will capitalize the costs of irrigation, the price of fertilizer, the other investments that are part of modern agriculture? There is moreover the question of method. How does a country with limited communications, transportation, and administrative systems implement programs of range management over vast areas of land, with nomadic peoples who readily cross in and out of the country? Finally, how is donor coordination achieved when the Malian government in the past has discouraged such coordination or at least has taken no initiative to facilitate it?

The DAP recommends a significant level of resources for Mali. The reasoning is that the potential of the Niger, both in Mali and in the balance of the basin, cannot be ignored if the region as a whole is to break out of its marginal existence. The development of the potential, the raising of incomes and the opening up the inland areas through better transport represent part of the answer to the question of the economics of basin development. Furthermore, the energy and ingenuity of the people cannot be ignored. In Mali, programs in livestock are being developed,

by Malians, which may answer some of the questions of range management for the entire Sahel. In rural education, Mali is pioneering in low cost functional literacy and integrated education and agricultural development. In the use of advanced techniques -- earth satellites imagery, land-use planning, computer modeling -- Malians are often in the forefront in the region. Finally, AID can play a critical role in enabling Mali and the international community to realize the full potential of those major capital investments that will be made in the country, with or without AID participation, like the Manantali and Selingue dams. For the critical difference might well be the investment in human resources, in which AID can make a special contribution.

The DAP recommends a strategy in Mali that focuses on sector level policy, area development programs and maximum development of Malian skills. In livestock, support for a number of activities have been grouped under a sector grant in FY 75; this approach offers opportunity to develop specific area programs, to develop experience in tackling problems like range management, and at the same time, to deal at the national level with policy issues like sector financing, pricing, and land use planning. Similar approaches, albeit developed over several years, are recommended for agriculture and health, with supporting efforts tied more closely to the IBRD in rural education.

1. Agriculture

a. Water management represents one of the most significant yet largely untapped potentials for increasing agricultural production and preventing future calamities in Mali. Training at all levels of water resource planning is proposed, but using primarily in-country seminars by visiting (but non-resident) Americans. This approach maximizes the relevance of the training to the immediate tasks facing Malian personnel. The training also helps Mali to pay a more effective role in the Niger River Commission. $700,000 would fund such training for 3 years.

b. Food production can be increased, and skills developed, through relatively small-scale investments in pump irrigation and better dry-land management practices. These practices need to be introduced in several different parts of the country, however, to meet the GOM's desire to avoid serious pockets of famine during a future drought. AID could group several such projects together under a single grant -- e.g., expansion of Operation Millet-Mopti, irrigation improvement at Baguineda and Haute Vallee, mixed agriculture-livestock at Gao -- in order to help the GOM implement experimental programs and improve both extension and farmer skills. Much of the cost would be local operating costs. Centralized administration of a single grant would allow for better evaluation, ease of control, and better focus on policy issues. Approximately $3 million each in FY 76 and FY 77 would enable these programs to develop and facilitate sector-level cooperation as in the livestock sector, with larger grants to support expanded area coverage and broader inputs (e.g., rural roads) in FY 78.

2. Livestock

The FY 74 and FY 75 grants, totalling probably more than $13 million in this sector, represent major undertakings by AID touching on nearly all aspects of the livestock sector in Mali. These programs, especially given the degree of US-GOM cooperation in developing them, warrant major focus of AID management and technical support over the coming years. Unquestionably, the results of these programs could justify further investments particularly in the marketing area where the first grant covered largely pilot efforts for test and evaluation. The FY 75 grant, focusing on grazing land and tse-tse clearance, is also predicated on follow-up activities. Rural education efforts are tied into the grazing effort, as well. Finally, the policy issues under discussion in the FY 75 grant, e.g., increased Malian funding of livestock programs, have implications for other donor inputs. In sum, livestock should remain a primary sector of AID concentration in Mali with further grants in FY 77 and beyond. Up to $10 million annually would appear both feasible and worthwhile.

3. Education

a. Rural education. Mali has avoided much of the institutional overlap and competition displayed in other countries between rural education and agricultural extension and development. Both the Centres d' Apprentissage Agricole and the Functional Literacy programs should be considered for capital and technical assistance. IBRD evaluation of parts of the Functional literacy program should lay the foundation for an FY 77 contribution. In the interim, support for rural education programs should be included in AID's support of agricultural area development programs, which is in line with GOM policy for such programs.

b. Primary education. A study is now underway, with IBRD assistance, evaluating experimental reforms and low-cost alternatives in Mali's primary education program. AID assistance to expansion of suitable reforms should be considered, probably for FY 77.

4. Health

a. Health Centers in the Regions of Economic Development. As an initial bilateral effort, AID should consider support to those rural health operations in Mali which are related to operations for production and other aspects of rural development in the area. This links health services to complementary activities to increase income and to an organizational structure which can integrate them into a broader rural development program. These initial efforts, in Operation Peche, Mil-Mopti, etc., can lay the basis of experience and cooperation for broader sector-level support in health, beginning perhaps in FY 78.

Operation Peche, for example, has been developing its own medical care delivery system and has a program drafted which would provide medical care to approximately 180,000 fisherman and their families. The Operation is

soliciting assistance from USAID for providing it with sufficient funds to purchase drugs for the first three years. During this three year period they will develop their own capability to buy their drugs later on.

To give a second example, in 1971, there were 1,204 cases of guinea worm reported in Mali. Of these 472 were reported from the Region of Mopti, especially from the circles of Koro and Bankass which lie below the Bandiagara Cliffs and where AID's support for millet production was focused. This area is scheduled to be developed further within the framework of Operation Mil. Because of the depth of below the surface water in this area, populations prefer to use water which accumulates in hollows dug out in the process of excavating mud for building. This situation is ideal for transmission of the disease.

AID should give consideration to assisting a guinea worm control in the area of Operation Mil, where AID is considering an expanded program, some elements of which directly relate to water supply. Any guinea worm program should be accompanied by a general preventive health effort, thus combining a visible health improvement activity with the introduction of broader health education. The combination of curative and preventive efforts geared to specific local circumstances, should be mutually reenforcing.

b. Retaining of Health Personnel. Although Mali does not suffer from a lack of paramedical personnel, these personnel are often sent out to peripheral rural areas where they eventually are cut off from the mainstream of developments in health care and practice. A national program of retaining of health personnel is required. This could be done at the regional level by a travelling faculty of competent personnel recruited from within the country. A three to four day course would be all that would be required to cover the updating of medical treatment practices. Overall, this type of program would not be very expensive, most of the cost coming from travel expenses and lodging expenses for the personnel to be trained and for the faculty. AID should consider assisting this approach in one region of Mali on a pilot basis and then, if successful, helping extend the approach to the remainder of the country. This activity would represent a logical adjunct to programs in the Operations.

C. MAURITANIA

Mauritana represents the dichotomy of relatively high earnings from minerals -- 36% of GDP, nearly 80% of exports valued at around $80 million annually -- but with over 90% of the population in the rural sector, largely untouched by the minerals earnings. The country is divided ethnically and geographically, with the mining and administrative centers in the north, along with nomadic livestock herding, and the largely Toucouleur farming population concentrated along the Senegal River. Transportation between these areas, particularly for making investments in the Senegal River basin and facilitating marketing of surplus crops, is weak. Manpower is in very scarce supply, with only one small training facility for agricultural workers with a total enrollment of only 70. Mauritania is a food deficit area, and its livestock industry was severely hit by the drought. Its prospects lie in livestock, and eventual exploitation of the river area, but the pace of development will be slow, to the point that Mauritania may lag critically behind its neighbors in realizing the potential of the Senegal River basin development projects.

AID strategy in Mauritania has to take into account the rhythm of doing business in the country. Project development, approvals, project negotiations and agreements, appointments, travel, are all especially time consuming. AID's ability to deliver goods and services, especially of a long-term nature, has been severely hampered in this country due to the harshness of the environment. Only in late 1974 are some of the R&R projects, identified a year earlier, getting under way. Mauritania's manpower constraints compound the problem.

For this reason, the DAP recommends no new bilateral starts in FY 76, except for R&R add-ons as needed. Instead, the present projects and the mid-term livestock project at Selibaby should be the focus of AID concentration. In these projects, two important themes can be developed and evaluated: the capacity of local level officials (Provincial Governors and below) to mount and implement projects, and the feasibility of locally administered range management schemes. Out of this experience, programs for FY 77 and beyond might be developed.

1. Agriculture.

a. Sorghum and millet. With other donors working on rice cultivation along the river, AID might focus on sorghum and millet production, the cultivation of which by some farmers must be adjusted and improved to correspond to the demands of irrigated rice. Almost no work is going on regarding these crops, not even pilot research and extension efforts.

b Training. UNDP is interested in AID assistance for expanding and improving the training facility of Kaedi. One of the requests is for advisors/instructors, who will not be easy to recruit for that location. Nevertheless, training is such a great need that AID should investigate the potential for assistance.

c. Grain stabilization at the local level. Province level purchasing, storing and marketing of grains could be an important means of avoiding food shortages and encouraging production. National marketing is too limited for a nationwide system, but a local level system could be most relevant.

d. Seed multiplication. AID considered and turned down a proposal for a seed multiplication farm during the mid-term project review, because there was inadequate evidence of the effect on food production in the near term. However, over the longer term, with increased emphasis on irrigated agriculture along the river, the proposal may be desirable. The GIRM is still interested in the project, and the UNDP is prepared to provide complementary assistance.

2. Livestock.

The Selibaby project, as presently planned, includes a major component of study and design for a possibly larger project in the Kiffa area. The study includes attention to nomadic patterns, sociological factors, and the interrelationship of selected watering points to migration, as well as technical questions of water and range management. The study and design could have important implications for GIRM policy on range management, and is so seen by the Director of Livestock. Based on these studies, AID should be prepared to program funds of $5-10 million in livestock for FY 77-78.

3. Education.

Beyond consideration of an agricultural education activity at Kaedi, AID should provide regular high and intermediate degree level training for Mauritania officials in rural development, perhaps utilizing Hassan II Institute in Morocoo which AID has been assisting. Mauritania should also be the site of regional, inservice training as recommended in the regional section of the DAP.

4. Health.

Utilizing the services of a regional health advisor, and, initially, flexible R&R-type funding, AID should consider health assistance in the following fields:

a. Upgrading the Health Delivery System. In Mauritania the upgrading and expansion of the health delivery system requires two somewhat different approaches: one to reach the sedentary population and one to reach the nomadic population.

Fixed Operations: The delivery system for reaching the sedentary population could be developed along the same lines as described for Senegal. that is from the ground up, starting with health operatives in the villages, rural dispensaries and mobile units. The need to coordinate donor inputs through the offices of the GIRM itself is a necessity. The objective for

FY 76 would be to decide which region to upgrade first, taking into consideration other presences (Algeria, China, France) and encouraging the GIRM to seek other donors' commitments for specific tasks. UNICEF has already indicated a willingness to provide vehicles and a maintenance training program. It might be appropriate for the GIRM to seek fuel from OPEC or some single Arab donor, such as Algeria. The US and UNICEF might cooperate in organizing one or more of the mobile teams as a "roving faculty" to provide basic health training to village health agents in addition to their regular responsibilities. This could be done with Peace Corps assistance.

Mobile Operations: The nomadic population should be considered from a somewhat different angle. Given the fact that their circuits are well-known and that these are interrupted at specific points at different times of the year, mobile health unit itineraries could be designed to meet their needs at regular dates of the year. These mobile units could be organized as small caravans that would use camels instead of jeeps for the transportation of equipment and personnel, and tents instead of cement structures for their operations. Figures regarding this aspect of the upgrading of health services are extremely soft as it is not yet known what percentage of the nomadic population will sedentarize as a result of the drought. The elaboration of a concrete plan to achieve the goal of bringing preventive medicine to nomads and their cattle might also be the responsibility of the office of the Dakar-based health technician.

b. Supporting Nutrition Backstopping. The creation of some type of nutrition agency in Mauritania might be extremely valuable in supporting an upgrading of health and creating inroads into the life of the rural masses, provided it can be staffed and that it complements, not duplicates, the services of the regional organization ORANA.

D. GUINEA

In November 1974 a separate team visited Guinea to determine the prospects of initiating assistance in the agricultural sector, specifically aimed at food production. A summary description of that project follows:

I. Summary description of recommended project

This is a project to improve and develop the food production capability of Guinea. It includes assistance in the areas of: (1) agricultural education at two levels, i.e., (a) training of agricultural technicians/assistants just below the Bachelor of Science/Engineer Agronome level, and (b) training at the university level (Faculty of Agriculture); and (2) development of an extension demonstration unit that would concentrate on introduction of improved agricultural practices including expanded use of animal traction and limited use of tractor drawn equipment; (3) applied and adaptive research. We would provide assistance to a small research unit (a sub-station of the Faculty of Agriculture) to be established at Faranah. This unit is referred to in Guinea's Five-Year Plan as a research institute. It would engage in adaptive research required to advance agriculture in the region.

The Guinea Government and the AID Team place first priority in this proposal on development of the agronomic-animal husbandry demonstration farm.

Requirements for technical assistance personnel are quite limited for the proposed project. We are recommending use of short-term consultants to assist the Faculty of Agriculture at Foulaya. It has been determined that research technicians are needed in the following areas:

1. Nematology
2. Pathology
3. International research linkages
4. Agricultural equipment and laboratory equipment installation and training

At the proposed Faranah agriculture education, research and demonstration complex we anticiapte the need for four technicians under an International Voluntary Service type contract:

1. Agronomist (team leader)
2. Agricultural Engineer-Irrigation
3. Livestock Production Specialist
4. Heavy Equipment Operator

It is proposed that Guinean-owned PL 480 currencies be used for construction. Although buildings at the new site of the Faculty of Agriculture are good, there are not enough of them. The Regional School of Agriculture, the proposed Research Institute and Demonstration Farm will have to be built. The Regional School of Agriculture is making do in an old abandoned building built by the former French colonial government.

Substantial commodity inputs are to be provided for the Foulaya and the Faranah complex. A modest number of graduate level participant training grants will be made.

There are close linkages between the Faculty of Agriculture and the units of the proposed Faranah complex which this project would strengthen. A detailed explanation of these linkages are to be found in the Project Review Paper.

Project outputs would result in higher yields from food crops and livestock, providing a model extension/demonstration unit at the Faranah Federation (province) level to move research to practical application by farmers.

Project rationale

As stated earlier in this report, AID has agreed to explore possibilities for cooperation in the area of domestic food production. In this exploration process the Project Identification Team has had an opportunity to observe agriculture in most of the country. We found abundant good land and agricultural water, but a lagging production in agriculture. Guinea has the land and water resources to produce most of the rice needed by West Africa, but instead Guinea now has rice deficit of 60,000 MT annually.

Causes of deficit production and an overall somewhat stagnant economy are the following:

1. Soft currency (official rate - $1.00 to 20 sylis; unofficial rate - $1.00 to 200 sylis);

2. Dearth of trade goods, particularly in rural areas;

3. Lack of economic incentive to farmers (offical price of rice is 9 sylis/kg for paddy, 15 sylis for milled rice, but 60 sylis blackmarket);

4. An ineffective extension system. Most agents ("controllers") have no transportation and little to extend in the way of improved practices in a "production package", even if transport were available;

5. A struggling but potentially viable agricultural education system;

6. An underdeveloped national research system;

7. Lack of agricultural investment (development capital).

As we have stated, these economic factors preclude serious consideration at the present time of AID assistance to major direct production projects. We have concluded that such projects cannot be justified economically at the present time. Our Embassy in Conakry believes, however, that the economic situation is improving with rather significant extractive projects (bauzite and iron) underway in the country.

Noting that we have opted for nonconsideration of direct production projects, we believe that by directing AID inputs into selected agricultural institutions needed to develop a modern agriculture, we can assist the GOG to get its agriculture moving as the country's economy improves. By a transfer of AID resources, we can effectively influence the quantity and quality of research and assist Guinea in making international and African regional research linkages now lacking. A few Bulgarian and People's Republic of China technicians are now aiding the GOG. We saw no improved high yielding varieties being grown nor were we told of any being multiplied. The Chinese are reputedly doing some rice research at Kankan. It is believed that some improved rice varieties could be adapted and more than double yields.

The proposed Extension/Demonstration Farm would concentrate on improved agricultural practices through the "package approach". An approach combining animal traction and tractor cultivation would be used.

This farm would serve as the practical training unit for the Regional Agriculture School. Agricultural work brigades would be brought in from villages in the Federation (province) to observe and learn from the crop and livestock production demonstrations. A most important function of the Farm is development of a modern 20 hectare irrigation unit with levees to control water in the rainy season and supplemental pumps for all seasons. This unit is intended as a pilot for widespread application in the Haute Guinea flood plains. A cropping system for this unit is to be developed as part of the project.

II. Outline of project design

A. Elements of project:

1. Proposed Agricultural Education, Research and Extension/ Demonstration Complex - Faranah. Interrelated components of this complex include (a) an Institute for Adaptive Research, (b) A Regional School of Agriculture, and (c) an Extension Demonstration Farm.

2. Faculty of Agriculture - Foulaya.

B. Project development schedule:

1975 (Calendar Year)
- AID Project Manager on board (Conakry) - July 15
- Obligation of project funds - August 15
- Negotiation of university consultant contract - completed - October 30
- Negotiation of IVS contract - September 30

1976 (Calendar Year)
- Technicians on board - March 1

C. Other donors - UNDP:

The UNDP has projected a five-year program in Guinea from 1974-78 totaling $24,000,000. Eight million dollars in budgeted over the entire program period for the rural development sector which consists primarily of agricultural projects. Two million dollars is budgeted for agricultural education. Some of the projects planed in the five-year programs follow:

1. A seed production project at Koba
2. Manioc and corn cultivation improvement at Dalaba
3. Palm oil project at Boke
4. A forest inventory
5. Agronomic research assistance at Foulaya
6. A soil classification survey
7. A food protection project
8. A small hydraulic/agricultural project in drought affected areas (Kankan, Siguiri, Labe), small dams and wells using traditional techniques
9. Sanitary protection of livestock project
10. Selection and multiplication of N'Dama cattle species
11. Project to study possibilities of feed concentrates for livestock and poultry
12. Project for development of bee culture
13. Fisheries project (sea fishing and fresh water)

14. Training in commercial fishing

15. A factory for conversion of manure and human excretion to fertilizer

Most of this ambitious program is in the planning stage. Two of the projects are scheduled to begin soon (the first two listed above). The UNDP personnel stated that program coordination with AID would be desirable for implementation of their projects, and they were prepared to cooperate with us on our program(s) in Guinea if this seemed desirable.

UNDP officials suggested that the primary obstacle to increasing food production in Guinea is the low purchasing power of Guinean currency (sylis), which has minimized incentive to the farmer.

D. Financial plan:

1. Project Budget

Estimated cost of the project for the three years contemplated, FY 76 to FY 79, is as follows:

United States	$1,765,000
Government of Guinea (local currency equivalent)	$8,220,000
(U.S. $1.00 = 20 sylis)	
Total	$9,985,000

TABLE I

Estimated U.S. Costs by Functional Segment

Segment	FY 76	FY 77	FY 78
Faculty of Agriculture	$320,000	$320,000	$320,000
Faranah Agr.	390,000	210,000	205,000
	$710,000	$530,000	$525,000

E. UPPER VOLTA

Upper Volta is a poor land-locked country whose 1970 per capita GDP was $59, one of the lowest in Africa. In the agricultural sector, which supports 89% of the population and 94% of the resident labor force, annual per capita income was only $28 in 1970. Upper Volta's development suffers from serious growth constraints such as lack of natural resources including water, remoteness from the sea and high transport costs, uneven population distribution resulting in regional over-population and soil deterioration, diseases and a low level of education.

Since independence the Voltan trade balance has been strongly negative, increasingly so in 1971 and 1972 owing to the drought. Exports covered only 30% of purchased imports in 1973. This deficit has been compensated for by (1) wage remittances from Voltaics working largely in the Ivory Coast and (2) large scale foreign assistance. Approximately 75% of the second development plan (1972-77) must be externally financed. Government plans emphasize the development of the country's limited natural resources with priority on mineral extraction (e.g., manganese); exploitation of those Volta valleys which are presently uninhabited due to river blindness (onchocerciasis); improved use of water resources; increased dryland agricultural production; and improved quality and productivity of the national herd. The spearheads of the development effort are the Regional Development Organizations (ORDs), which are individually supported by various external donors. Voltaic farmers are hard working and rapid to respond to opportunities as they see them.

The DAP recommends a significant AID involvement in Upper Volta. This involvement should concentrate first on increased agricultural production and rural development in heavily populated areas which suffer from a deteriorating agricultural resource base, and secondly on well-planned exploitation of areas with heretofore untapped agricultural potential. Over the long run, Upper Volta should be able to both feed its own population and export significant amounts of food (cereals, vegetables, livestock) to neighboring coastal countries. AID projects should be on concessional terms. The government which has a surprisingly large fiscal reserve should be encouraged to cover a proportion of project-related local costs.

1. Food Coops and Livestock

AID support in the agriculture sector should be designed to complement extensive other donor assistance. The first major emphasis should be to ensure the availability of inputs required to maintain production in areas such as the Mossi Plateau where overcrowing and other factors have led to deterioration of the soils and decreased production. Programmatic recommendations for the next five years include:

a) Soil Fertility

AID should support a research program to establish systems for maintaining soil fertility. This would include the development and use of local phosphate deposits beginning in FY 77.

b) Plant Protection

Substantial production is lost each year in Upper Volta due to disease and pests. AID should assist in developing a national system of surveillance and early warning, a laboratory for the identification of pests, and a capacity for quick response to minimize losses due to outbreaks of pests and disease.

c) Livestock

Livestock provides 45% of Voltaic exports (although approximately 1/5 are re-exports of animals from Mali). Livestock is important as a means of livelihood for migratory herdsmen in the Sahel ORD and to a lesser degree in the ORDs of Fada and Koupela. Due to high population densities and the need to increase crop production, the government places high priority on the development of animal traction combined with small holder fattening operations in much of the country. Beginning in FY 76, AID should explore selected livestock sector activities such as livestock development in the Sahel ORD, and should consider support for animal traction, small ruminant production and small farmer cattle growing in the Sudanian zone of Upper Volta. All AID activities in the livestock sector must take account of range management needs to ensure balance between animals, water, and pasturage.

2. Regional Development

A second emphasis should support exploitation of regions of Upper Volta with heretofore untapped agricultural potential. Such activities should include:

a) Onchocerciasis-free area development

The settlement and development of the fertile valleys of Volta Basin presently uninhabited due to onchocerciasis is the government's first development priority. Up to 750,000 people can be relocated in these areas from the overcrowded Mossi Plateau. This would provide very important, but still temporary, relief from the problems of population maldistribution. AID should plan to provide major capital assistance ($12-17 million over the next 10 years) to assist the GOUV and other donors in the development of these regions. AID planning and management technical assistance may be requested for the Pama region of the Eastern ORD.

b) Continued support to Eastern ORD

Over the next five years major assistance transfers will be required to continue and expand the USAID integrated rural development

activities begun in FY 75 in this relatively undeveloped, but potentially rich agricultural region.

c) Surface-water utilization

Water use is a major problem in much of Upper Volta. AID should assist the government in improved utilization of the country's limited water resources, especially by small farmers. This would include bas-fonds development, small dam construction and maintenance with a research component, possibly in conjunction with the Peace Corps.

3. Human Resources

In the education sector the most innovative activities in Upper Volta are being tried out in rural education. A number of programs (Centre de Promotion Rurale, Groupements Post Scholaire, 4-C Club Program) are aimed at increased agricultural production and rural community development usually with donor support to specific ORDs. Following the accepted pattern of donor assistance in Upper Volta, AID should initially concentrate its human resource activities in the ORD which we support - the Eastern ORD. After a thorough review of existing programs, AID and ORD leadership should determine which institutions would be most appropriate for the different environmental situations of the Eastern ORD, and develop and evaluate pilot programs before embarking in a major rural education program in the region. AID must also pay close attention to the needs for development of administrative/management cadre and extension agents for the Eastern ORD.

4. Health and Nutrition

Although government health resources are misallocated in Upper Volta - 80% for personnel, accompanied by a steady decrease in allocations for medicine and technical equipment - foreign assistance has taken up much of the slack. No major program for ruralization of health services appears imminent. Aside from ongoing assistance in onchocerciasis vector control, AID should concentrate its health sector resources in Upper Volta on problems of nutrition, especially in the Sahelian zone and in the overcrowded, undernourished Mossi Plateau area where nutritional conditions appear to be deteriorating. AID should consider a program including nutrition rehabilitation centers, nutrition education and, in liaison with the Agricultural Service, promotion of more nutritious crops.

F. NIGER

Niger is one of the poorest of African countries with a per capital GNP of $100 and a national budget of only $60 million. Nevertheless, the Nigerian economy grew steadily albeit slowly until the drought, due largely to mining and increased cash crop production. The country suffers from its unfortunate geographic location, high transport costs, limited and variable rainfall, and limited human resource skills. Niger is presently dependent on donor assistance, and self-sustained economic viability will be possible only if additional mineral resources are discovered (explorations for oil, phosphate, manganese and additional uranium are presently underway).

Crop production and livestock are the most important sectors of the economy for employment, exports, domestic products and income. Despite major constraints, Niger was a net exporter of cereals prior to the drought, exporting significant quantities of peanuts and cotton. Niger was a major supplier of beef to Nigeria and other coastal countries. Donors have flocked (at least temporarily) to assist Niger in rebuilding and expanding its agriculture sector (including livestock) but progress is slow because transport systems are sketchy, farmers isolated and traditional, rainfall customarily precarious, and Nigerien planning and management skills practically non-existent.

Nevertheless, we feel that carefully planned USAID assistance programs, especially when complemented by human resource development, can help to bring important benefits to Niger's beleaguered populace.

1. Agriculture

Niger's government places highest priority on self-sufficiency in food crops. The new military government places increased importance on the development of irrigated agriculture, especially along the Niger River, as an insurance policy against future famine in case of drought. The government also realizes that self-sufficiency depends primarily upon increased dry-land crop production. AID has designed a major project which will provide the essential elements of a national program for quickly introducing the results of agricultural research into the farming system of Niger's small cereal farmers. We fully endorse this Niger Cereals project. Although this $9.0 million project will require major AID attention over the next five years, it should be complemented by additional activities in the agriculture sector.

a. While high government priority is being given to major irrigation projects, particularly on the Niger River, excellent opportunities exist for modest investment in intensive development of dry steam beds (dallols) in western Niger, which will benefit small

farmers. AID should cooperate with the GON in hydrological, soils, and engineering studies to determine the feasibility of dallol development and, if results are positive, to assist in their exploitation.

b. Niger soils are nearly universally deficient in phosphorous. Promising deposits of phosphate rock have been reported. AID should provide help in assessing the quality of the deposits, the feasibility of their exploitation and, if promising, AID should assist in developing the mines and facilities for producing phosphate fertilizers.

c. The development potential of the SW region of Niger (west of the Niger River) which boasts the country's highest rainfall (600-750 mm) and relatively good soils, will be increased by forthcoming river blindness (onchocerciasis) and tsetse control programs in the area. The area has the potential to produce substantially increased levels of cereals, is a major livestock transit area, and could supply products such as firewood, small ruminants, milk and vegetables to the nearby Niamey market. On the initiative of the RDO, a development plan for the region was recently prepared. Although an integrated rural development project might ideally be initiated in the region, the new Nigerien government is disillusioned with that development approach and new mechanisms for delivering donor assistance to a single region in Niger must be found. We suggest a series of area-specific (a few villages) projects carried out by AID, VolAgs, and Peace Corps for activities such as bas-fonds development, national exploitation and marketing of firewood, small ruminant production, milk production and marketing, animal traction, and crop diversification. Should sociological studies indicate that resettlement of people now precariously farming north of the old French "limit to cultivation" (300 mm) is feasible in areas to be cleared of onchocerciasis, AID should provide limited capital assistance to a settlement program in SW Niger.

d. A major constraint to agricultural development in Niger appears to be the non-availability of agricultural credit. The agriculture sector is allocated only 1.1% of Niger's development credit. The problem lies in the lack of a suitable credit policy and credit institutions. UNCC, the credit and cooperative society which should provide credit at the lowest level, limits itself to financing crop commercialization rather than providing loans for transformation of the productive structure. A credit activity would be a rational follow-on to a successful Niger Cereals project.

Livestock, especially migratory herding, is a major industry in Niger. Several donors are active in the sector and AID resources should be used cautiously to supplement those efforts and to assist the GON in finding new ways to deal with the problems of migratory herdsmen. We recommend that initial herder seminars be held

in conjunction with a UNDP project near Agadez, possibly leading to larger-scale investments. The training of a livestock service cadre in such matters as range management is also a critical need.

2. Health

The Niger national health system emphasizes the low cost delivery of services utilizing paramedical personnel at the intermediate level and volunteers at the village level. The program is well suited to the financial and material conditions of the country. The government has clearly realized, however, that such a system cannot function effectively without the constant re-training of personnel at all levels and without regular supervision. A well-conceived national program for the retaining and supervision of health personnel has been prepared by the government: AID should seriously consider funding a portion of the program. Training for the program could be carried out at Lome under the auspices of the regional Strengthening Health Delivery Systems project. A training laboratory/research area in Diffa or elsewhere should be considered to support the national retraining program.

3. Human Resources

As noted above, human resources is a major constraint in Niger. AID should further investigate human resource interventions at several levels: a) degree-level training at the school of Agriculture, University of Niamey. This school also trains substantial numbers of Voltaics; b) assistance to the UNDP supported National School of Administration; c) agricultural extension agent training at IPDR; d) farmer and youth training via radio clubs; 3) independent evaluation of the Educational Television program using methodology developed by AID in the Ivory Coast.

G. TOGO

Togo is a small (2.1 million inhabitants) coastal state whose growth is highly dependent upon its trade relationship with its neighbors. Togolese industry is expanding rapidly but must supply a regional market to be efficient. Low import duties encourage the country's development as a corridor for trade - legal and illegal - with its neighbors. Commerce and transport are major growth sectors.

Togo has enjoyed an average annual growth of 8% since 1968 and per capita income reached approximately $180 in 1973. Intersectoral and inter-regional disparities encourage a steady population migration from the disadvantaged northern regions to the already overcrowded urban and rural south where soil depletion is a major problem.

Increased exports plus large-scale external assistance ($24 million in 1971) since independence has allowed the government to build up public and foreign exchange resources. Yet the trade balance is still slightly negative and donors provide 70% of the government investment budget. Agricultural products (coffee, cocoa, peanuts, palm oil, cotton, copra) accounted for 60% of the value of exports in 1970 but their relative importance has declined recently in the face of increased phosphate revenues (46% of export earnings in 1973). The government nationalized the phosphate industry in 1974; and with world market prices rising, phosphate receipts are expected to reach $150 million in 1974. Unfortunately, there are indications that these monies are being used for prestigious construction projects rather than for further development or diversifications of the economy.

A third five-year government plan (1976-80) is now being prepared. The plan reportedly will stress: (1) agricultural development (meeting domestic food requirements, food processing for export and for the domestic market, export of raw agricultural products such as coffee, cocoa, cereals); (2) rural development with increased emphasis on the northern regions (the President is from La Kara province in the north); (3) human resource development; and (4) the further development of the mining and industrial sectors.

AID should continue to provide limited assistance to Togo over the next five years, both through regional mechanisms such as the Entente Fund (for agriculture, livestock, transport, African enterprise programs) and through bilateral channels in the health and human resource sectors. Assistance should be provided on harder terms than in the past, due to Togo's increased availability of phosphate revenues.

Agriculture

The agriculture sector employs 85% of the active population in Togo. Seventy-five percent of agricultural production is in food crops, only

one half of which enters the market. Climate and soils are generally favorable. But because of population maldistribution, land is over-farmed in the south while it is estimated that one half of Togo's cultivable land (all in the central and northern regions) is not farmed.

Food crop production has grown slowly due to (1) insufficient investment in agriculture and related infrastructure; (2) inefficiency of extension services; (3) market and price policies designed to encourage exports and increase revenues to the government. Nevertheless, Togo still manages to produce sufficient food to meet domestic consumer demand, although per capita farm incomes average only $70.

Discussions with Togolese officials indicate that efforts to increase production will center on "viable" (i.e., large scale) units often in conjunction with improved water management and irrigation.

The national livestock herd is relatively small with only 20,000 cattle and 1.3 million sheep and goats. Domestic demand for meat is growing, and Togo imports substantial and increasing amounts of meat products from her northern neighbors. The GOT hopes to increase domestic meat supply and has developed a long list of projects dealing with livestock production, veterinary services and livestock marketing for which it hopes to find donor financial support.

Agricultural development programs, and rural development generally, are presently hampered by a poorly articulated government infrastructure. The regional development organizations (SORADs) which had been established in each administrative region are presently in disfavor and their functions are being transferred to a myriad of single-crop or single-purpose organizations for which no overall coordinating mechanism at the regional or farmer levels have yet been designed. New UNDP and IBRD initiatives will hopefully assist in rationalizing the provision of government services to the rural sector over the next few years.

AID regional assistance in the agriculture sector would be most usefully concentrated in the following problem areas:

1. Varietal Selection and Multiplication of Seeds. Like Dahomey, Togo suffers from use of traditional maize and sorghum seed and from limited seed multiplication facilities. Through the JP 26 program and the AID/Entente food production program, AID should assist in selection, testing, multiplication and distribution of improved varieties of seed.

2. Grain Drying and Storage. High storage losses in the humid south significantly affect the price and supply of cereals marketed for domestic consumption. As in Dahomey, an AID/Peace Corps project to improve on-farm storage should be explored and regional storage units might be constructed with government and other donor support.

3. Assistance to rural development activities in the northern region (Dapongo). Once the GOD rural development structure is sorted out, AID should consider providing assistance to regional development activities in the north through the AID/Entente livestock and crop production programs. Possible areas of assistance include animal traction, farm machinery and carts, agricultural credit, and peasant livestock.

4. Small farm poultry and pig production. Through the AID/Entente livestock program, AID should explore with "Togograin" the feasibility of mounting a small farmer poultry and pig production scheme, perhaps with a portable grinder mixer. The scheme might be implemented through existing cooperatives. It is essential that a supply of locally produced feed be available. The project might be a natural follow-on to the grain drying and storage program.

5. Economic development of onchocerciasis-free zones. If resettlement plans for the Sansanne-Mango onchocerciasis area of north Togo are oriented towards small farm agriculture rather than large, "viable" agriculture units, AID should consider limited loan assistance to assist in area development.

Health

Togo's health policy is presently oriented towards curative medicine, the enlargement and improvement of central health institutions and the training of high-level personnel. No large-scale AID activities in this sector are recommended unless government health policy is modified to increase emphasis on preventive health and on provision of health services to the poor majority.

Human Resources

In the education and human resources sector the country has made impressive gains in terms of school enrollment. By the end of the Second Five-Year Plan 54% of primary school-aged children should be enrolled. However, it also appears that with present financial resources, Togo is reaching a plateau and enrollments may level off. Consequently, the government is concerned that the education being provided is not productive and may be counter-productive in rural development terms. Therefore, the government is seeking new formal and non-formal education models and approaches to try to solve these problems and to reach the bulk of the population who are in rural areas. The models already developed require evaluation. Carefully controlled and evaluated pilot projects are also needed to assist in the analysis and development of additional models. In such a relatively progressive and open educational system, AID might be able to provide substantial assistance at relatively low cost by providing the expertise needed in these experimental and evaluation activities and by providing training for Togolese. Use of the Peace Corps presence in Togo should be considered to complement AID activities in the human resource sector.

H. DAHOMEY

The economy of Dahomey, one of the least industrialized countries in Africa, is largely dependent upon performance in the primary and tertiary sectors. The latter accounts for nearly half of GDP due to the large role of the government in the economy, to commerce connected with unofficial border trade, and to Dahomey's role as outlet to the sea for Niger. Since independence, the government has absorbed large numbers of Dahomean bureaucrats used by the French in other parts of French Africa and government expenditures are allocated largely for salaries. No government investment budget exists and the government has been dependent on external assistance ($24 million in 1972) to finance investment projects and cover the large current account deficit. Dahomey has been plagued by political instability. Despite the large numbers of trained middle-level Dahomeans, the government has been handicapped by a largely inefficient bureaucracy. Although the country's population is officially estimated at only 2.8 million, the south is overcrowded (102-133 inhabitants/km^2 in the three coastal departments), while the northern and central regions are sparsely populated. Mobility between the three regions is limited because of traditional tribal enmities.

Future economic growth will depend largely on trends in world market prices for cash crops - cotton, palm products and cocoa - which accounted for 81% of value of exports in 1970, on crop diversification (sugar and coffee), and on the increased production of food crops. The country does not presently grow sufficient quantities of food crops or meat to meet domestic demand. Estimates are that production will remain about 40% behind consumption through 1976. The growth of the agriculture sector since 1965 has been largely limited to cash crops and rice production; the value of subsistence crop production and livestock production has increased by only 0.3% per annum since 1965. By contrast, the annual population growth rate is estimated at 2.8%.

Government malaise is now being challenged by a new Marxist-oriented military regime which has announced plans to place a high priority on rural development, increase development efforts in the north, decrease dependence upon external personnel, and limit the role of the private sector. A new government development plan is being prepared but development priorities were not formally communicated to the DAP team. DAP sectoral analyses for Dahomey are therefore based largely on somewhat dated written material and DAP programmatic recommendations must remain highly tentative.

What little we do know about development priorities in the new plan indicates that they coincide with AID's priorities. These include: emphasis on rural development, including ruralization of health services and human resource development; increased priority to development of the more disadvantaged regions of the country, especially the

north; and self-sufficiency in food crop production. Success in implementing the plan will, however, depend largely on the regime's ability to mobilize popular support in addressing development problems and to decrease bureaucratic inefficiency.

Present AID policy limits grant bilateral assistance to the health and human resource sectors in Dahomey. AID assistance to the crop and livestock sectors, as well as to transport and the African enterprise promotion programs, has been provided through Entente Fund programs. We believe that AID should continue to provide limited assistance to Dahomey, responding to official requests made either bilaterally or through the Entente mechanism, provided that the Government plans to address the laudatory objectives noted above in ways that meet AID assistance criteria.

Agriculture/Livestock. The following activities might be assisted through AID/Entente Fund regional programs:

1. Assistance to Atakora region development. The government has completed initial planning for development of this poor northwestern province (the President's home region). FED will undertake the major donor role in providing assistance to the program, but FED inputs could be complemented by discrete AID/Entente investments in the crop and livestock sectors.

2. Varietal selection and multiplication of seeds. IRAT indicates that the scarcity of quality maize and sorghum seeds is a major problem in Dahomey. Seed multiplication capacity is presently only 10 tons per year. AID should explore the possibility of providing assistance in this problem area through the JP 26 program and the AID/Entente Crop Production programs.

3. Grain storage. Storage losses for cereals reach 40% in the south and 25-30% in the less humid northern regions. The Peace Corps has participated in an on-farm storage program in recent years and the government is reportedly preparing projects which could improve on-farm and regional storage. AID should consider assistance to these programs, again through the Entente Crop Production programs.

4. Feasibility studies of rock phosphate deposits. Soils in Dahomey are generally phosphate deficient and rock phosphate deposits have been identified in the far north of the country. As part of its phosphate feasibility activities in other Entente countries, AID could provide technical expertise to explore the feasibility of the exploitation of Dahomean deposits.

5. Selection and cross-breeding of work-oxen for tsetse areas. Bovine trypanosomiasis is a serious problem in Dahomey with a reported mortality rate of 11.75% for the country, and as high as 16% in the northern region. The success of animal traction and small farmer cattle fattening programs in much of the country is largely dependent upon the breeding and distribution of tsetse resistant cattle. AID should consider providing assistance in this area through the Entente Livestock Program if requested by the government.

Health

Although government plans to ruralize health services are laudatory, we were unable to gather sufficient information to recommend AID project activities in this sector.

Human Resources

1. Education Reform. In the past, the GOD has attempted to "ruralize" primary and secondary education and to encourage farmer and artisan training. These experiments have apparently encountered major problems, although some schools in a few areas are quite successful. It appears that there will be a new and major educational reform promulgated in 1975 or 1976. Education officials are concerned that the reform may be imposed by fiat without evaluation of existing programs and without experimentation or pilot projects conducted to test the reforms before they are implemented nationally. If requested, AID could assist the GOD in evaluating earlier "ruralized" education reform programs in order to determine how that experience might be used to assist any new reform program or could assist in research and development for pilot projects which would form the basis for a viable national model. Limited assistance might be provided at the planning and/or implementation level in conjunction with other donors.

2. Ag Extension Training. Dahomey suffers from a significant shortage of agricultural extension agents, because training facilities (all in the South) have extremely limited capacities. AID might assist in development of "encadreur" training programs in the north in conjunction with rural development programs.

I. IVORY COAST

The Ivory Coast has achieved spectacular growth in the 1960s (averaging 7.5% annually) and the 1970s (dropping to 6% in real terms reflecting a substantial decline in the terms of trade). The traditional driving force of this growth, which has led to a per capita GDP of $349 in 1972, has been agricultural exports. Although early growth was based largely on coffee, timber and cocoa (80% of exports in the late 1960s), the Ivory Coast economy is rapidly becoming one of the most diversified of the region with increased industrial processing and import substitution capacity. Traditional agricultural exports are now complemented by increased exports of pineapples, oil palm products and cotton.

Much of the economy, however, continues to be dominated by foreigners and the distribution of the benefits of this growth have been far from even. The north has lagged behind the rest of the country's income growth inducing increased migration to areas of high productivity and potential employment. Non-Africans still hold over 80% of high and medium-level jobs in the modern sector while non-Ivorians hold almost one half of African positions in the sector. Ivorization of the country's employment structure and decreased regional disparities in the country's economic growth are primary concerns of the government.

If IBRD Price Forecasts for Major Primary Commodities are any indication, the recent downturn in the value of major Ivorian exports will continue and terms of trade will turn strongly against the country during the next years. The Ivory Coast also faces substantial short-term debt service payments and loses foreign exchange through large-scale salary remittances transferred by Voltaic and other foreign workers to their homes. Intelligent policy decisions (e.g. diversification of exports) complemented by high quality program and project design enables the Ivory Coast to absorb high levels of donor assistance efficiently. Continued donor assistance will be necessary if the country is to maintain high growth rates and political stability in the face of deteriorating terms of trade and increased political restlessness in less developed regions. AID should continue loan assistance to the Ivory Coast in food production, livestock and African enterprises through the Entente Fund and should seek to assure that AID lending at concessional rates will be available to the country under regional and multilateral mechanisms for programs which benefit the AID target groups (the "poor majority") in the more disadvantaged regions of the country and which enhance Ivorization of business, employment and administration.

Agriculture and Livestock

Export crops, the mainspring of Ivorian economic development, are grown principally in the southern and eastern regions of the country. Meanwhile, food crop production has grown slowly and the cost of food

imports has risen steadily ($44 million in 1973, excluding live animals). The north, where the country's potential for cereals and livestock production is concentrated, has not up to now shared in Ivory Coast's recent growth. The drought had serious adverse effects on the production of rice, maize, sorghum and millet in the north. It also led to increased migration of Fulani livestock herds into northern Ivory Coast from Mali and Upper Volta, sometimes leading to land conflicts with sedentary livestock raisers and farmers.

Objectives of the 1971-1976 Development Plan included: a) promotion of food crop production; b) development of the north - a recognition of growing regional disparities and food deficits. An ambitious program for development of the rural north is being designed with the assistance of the Development and Resource Corporation. The program will include development of agricultural production concentrating on maize and soybean production. It will also include development and improvement of Fulani livestock herbs in the north and a general program of livestock improvement (not yet planned in detail). The GOIC has requested AID assistance for the first two programs noted above. The programs appear basically sound and merit AID assistance through Entente Fund programs. Other programs in the north which will be prepared later, including the economic development of onchocerciasis free zones, may also warrant AID assistance.

Human Resources

Ivory Coast's primary level educational problems are at this point very similar to those found elsewhere in the Entente: a high repeater rate (over 30%), a lack of teachers (1 per 70 pupils), a classical type of curricula unadapted to the geographical, economic or social realities of the country, a drop-out rate of almost 10%, and a severe geographic imbalance in enrollment ranging from 95% on the coast to 5% in the north but approaching 50% as a national average.

ETV

It is anticipated that expansion of a major ETV program, begun in 1968 and supported by FAC and UNESCO, will help the country overcome many of the problems and inequities of the present education system. AID is engaged in final negotiations of a project which will provide funding for an External Evaluation Unit for the Ivory Coast's ETV program. The evaluation unit will provide decision makers and staff with accurate, objective information to facilitate more effective achievement of ETV educational goals. Pedogogical, economic, technical and management areas are to be evaluated in both primary and out-of-school education sectors. We believe the ETV evaluation should be supported by AID and careful consideration be given to adapting the Ivorian evaluation model and applying it to the Niger ETV program.

Health

On paper, the Ivorian infrastructure for delivering health services follows the pyramid-like structure found in most francophone countries of West Africa. However, as in other countries, the system is very incomplete. Emphasis has been on starting at the top of the pyramid instead of building it from the ground-up. Consequently, the rural areas have hardly been penetrated. For example, there are only 16 Maternal/Child centers in the whole country and, of these, six serve urban populations. Existing services demonstrate an urban bias and are particularly weak in the north and west regions where the environment is least favorable and health needs the greatest. The system also leans heavily toward curative rather than preventive medicine.

Although Ivorian Development Plans do include priorities such as rural health services and potable water in the north, planned investments have been accomplished at only a 35% rate between 1970 and 1974 and urban health services receive the bulk of the available funds. Should the GOIC, in fact, begin to increase funding for rural health services, for example in connection with the new development program in the northern region, AID should seek an appropriate regional mechansim for providing loan assistance for expansion and improvement of health services delivery in disadvantaged areas.

J. CHAD*

Development Plans and Priorities

Chad lacks natural resources, stable economic and political infrastructures, and encounters special handicaps due to its land-locked location far in the interior. The northern nine-tenths of the country consists of sahelian semi-arid grassland and desert which supports 1.9 million people. The Logone and Chari River Basins which are ecologically more favorable support the remaining 1.8 million people. In addition to these natural handicaps, Chad has been beset by serious political strife which has erupted several times into open fighting. Because of Chad's inherently difficult geographical position and because of the tense political situation, the country's economic growth has been minimal.

* This section was drafted prior to the change in government which occurred in April, 1975. Modifications in this strategy will be made following several weeks of consultations by a second DAP team with the new government. These consultations are presently scheduled for the fourth quarter of Calendar Year 1975. The new Chad DAP will appear under separate cover.

The precarious financial position of the government, which is especially vulnerable to external factors over which the government itself has little if any control, is also a major constraint to the expansion of the developmental activities. Chad can finance domestically neither investment nor current expenditures and is thus dependent upon external donor assistance. The economic growth potential of Chad in the near future is not promising and, despite its independence since 1960, in many ways the country and its leaders are still struggling to create a viable nation-state. The government's development strategy is apparently based upon increasing agricultural production in the southern, more densely populated region, with highest priority accorded to cotton production which accounts for about 75 percent of Chad's export earnings.

At present, there is no formal development plan for the country. Highest priority is given to the creation and maintenance of a sense of being Chadienne through the much publicized "authenticity" campaign and through sometimes rigid expressions of national sovereignty. Donors who are interested in working with the Chad Government must be especially sensitive to this cultural environment which affects both project planning and implementation.

Issues Affecting AID Assistance

1. Selection of Areas of Concentration

Past AID assistance to Chad has been channeled through regional organizations. Because of the drought and subsequent concern regarding Sahel countries, the U.S. is now proposing to initiate major bilateral assistance programs in addition to continuation of ongoing regional activities. Although Chad's requirement for assistance in nearly every field would provide numerous opportunities for AID involvement, the objective of U.S. assistance during the time frame of this DAP is to encourage the GOC and other donors to develop integrated agricultural production, and to develop a small cadre of trained professionals in agriculture or related fields, primarily water resources.

The area of agriculture is selected in recognition of the fact that between 90%-95% of the population is engaged in this sector and that this area is the productive base of the country. Because of the difficulties inherent in attempting to develop an effective agricultural program in a country with such a harsh environment and limited governmental infrastructure, and because of the major resource allocation required for mounting an effective program, no assessment of other areas was undertaken.

The sector statements in the country annex are based on previously drafted AID and other donor documents since the DAP team did not visit Chad. During November - December 1974, the Chad government had taken exception to a series of U.S. news articles which were critical of the Chadian government's handling of the drought emergency.

Since a new U.S. Ambassador was momentarily expected in Chad, it was believed that any in-depth discussion of future AID plans and government policies should be deferred until after his initial discussions with the government. Since these have now been satisfactorily concluded it is recommended that the CDO/Ndjamena be requested to initiate discussions with the GOC regarding the appropriate timing and terms of reference for an agricultural assessment team visit. Programs proposed herein for approval during FY 75 and FY 76 are based on extensive analyses undertaken in conjunction with the Sahel drought and can be implemented prior to completion of an in-depth assessment. Recommendations for FY 75 and subsequent years must be viewed as an indicative program subject to subsequent verification.

2. Strategy

The U.S. strategy for assisting Chad's agricultural development is based on three primary factors:

a) the fact that with such a large share of the active population living at subsistence levels and organized in traditional cultural patterns, programs to increase agricultural productivity will, to be effective, require a much greater knowledge of the environment, the rural population and the process of change;

b) the fact that institutional development and manpower training is required if external assistance is to be effectively used to build a Chadian capacity and to permit Chad to gain control of its own economic growth and development potential; and,

c) the fact that the limited financial and managerial resources of Chad are already over-extended and the GOC would face insurmountable barriers in attempting to mobilize additional resources required for development activities.

In recognition of these three factors, the U.S. and other donors have concluded that all project costs should be included in donor financing; that donors must finance the management requirements for all projects; and that all projects should incorporate extensive training programs and allow sufficient time for training prior to anticipated assumption of full responsibility by the GOC.

3. Crop Production

Although the potential exists for self-sufficiency in food crop production, Chad rarely produces a substantial surplus of food. Recurrent droughts, at least since 1968, result in local food shortages and in 1972-73 widespread famine necessitated large

relief shipments of grains from the United States and other donors. Problems of food supply are complicated by low yields, soil fertility depletion, inadequate storage facilities, insect and pest infestation of crops in the field and in storage, and competition from cash crops, notably cotton, which is Chad's most import export crop.

Improving and increasing cotton production is Chad's number one agricultural sector priority. Cotton is a major source of GDP, foreign exchange earnings, and government revenues. Cotton is also the major source of farm income for tens of thousands of farmers. In recent years, both the area and output of cotton have declined because of drought (which simultaneously induced farmers to increase the area in food crops), deficiencies in input delivery and extension services, and insufficient price incentives to producers.

While cotton is the government's highest crop priority, food crop production is the farmer's top priority. Millet and sorghum are the staple foods usually grown in rotation with cotton throughout southern Chad. These cereals are also widely grown throughout the the central Sahelian region, as well. Yields are low, production is highly variable, and the market is fragmented and poorly organized. Local food shortages regularly occur, particularly during the soudure, the two to three month period preceding the harvest. Improvement in millet and sorghum production and marketing will require improved inputs and techniques, as well as improving on-farm and village storage capacity, raising producer prices, and surveillance and control of the marketing activities of the small-scale grain merchants. Of particular interest to the Chadian government and donors is that the interrelationships which exist between subsistence food production and cotton production cannot be ignored in deciding strategies and designing programs to assure adequate food to farm families and to increase their incomes.

The major agricultural policy issue in Chad involves the unnecessary conflict between the government's desire to maximize cotton production in order to meet foreign exchange and fiscal policy objectives and the farmers' real need to meet subsistence requirements by emphasizing the production of staple cereals. Historically, the colonial administrators and the Government of Chad obliged traditional farmers to produce cotton to meet export demand and to have cash to pay taxes. Farmers on the other hand have persisted in according first priority to food crop production to minimize the risk of an inadequate food supply throughout the year, thereby guaranteeing their own subsistance. At the same time, production incentives and improved techniques have not been sufficient to generate increases in output. Moreover, a marketing system which could ensure reasonable prices to farmers and consumers alike does not exist.

The key to resolving this conflict and associated policy issues of price incentives and marketing lies in viewing the agricultural sector as an integrated economy in which emphasis is given to the production and marketing of traditional crops such as millet and sorgum, and modern crops such as rice and wheat, as well as the cash crop, cotton. There appears to be some recognition of the need for an integrated approach to agricultural development on the part of the Chadian government. Both the slowing of the rate of growth in cotton production in recent years and the extreme food shortages created by drought have helped create this realization. Such an integrated approach is implicit in the new "productivity program" for cotton now being undertaken in the southern region as well as in the polder development project at Bol on Lake Chad.

The proposed areas of U.S. assistance would build on this integrated approach to agricultural problems. In the southern region it is recommended that AID consider providing assistance for the institutional development and operational effectiveness of ONDR (National Rural Development Office) which is responsible for extension services in the productivity project area. ONDR also has the responsibility for assuring input delivery (seed, insecticides, fertilizers) for both food crops and cotton, and it has the responsibility for the administration and collection of credit extended by the Chadian Development Bank. Creating and re-inforcing a food crop extension capability among middle and lower level extension agents through in-service retraining programs is urgently needed. Funds ($2.0 million) are tentatively allocated for this project to be initiated in FY 1977.

To be effective, this institutional program will require an extensive knowledge of existing and potentially applicable programs of interest to the farmer (on-farm storage, plant protection, etc.). This base knowledge should be an outgrowth of work undertaken, using special Sahel funds, for insect control, plant protection, and storage. Funds are reserved ($5.0 million) for additional assistance in these areas, if necessary, beginning in FY 1977.

The third major area involves agronomic research and experimental production, in conjunction with the IBRD, using irrigated agricultural techniques in the polder region of Lake Chad. In order to put the polders under continuous cultivation, a solution must be found to the salinity problem by designing a duitable drainage system.

The area around Lake Chad which can be converted into polders cover approximately 150,000 hectares. Currently, the IBRD and AID are reviewing a proposed project that would initially put 3,000 hectares in three polders into wheat, corn, and cotton cultivation. The cost per hectare of putting the polders into production is around $5500 but results at the Matafou experiment station in the departments of Bol on these crops are very encouraging. The agronomic,

technical, financial and managerial feasibility of this project is being examined by the IBRD and by AID. Up to $4.0 million from special Sahel funding is being reserved for this program; and, if initial progress warrants continuation, up to $15 million should be made available in FY 1978.

4. Livestock

Chad, like most countries located in the Sahelian zone of Africa, has in the past been blessed with the natural conditions conducive to the maintenance of a substantial livestock population. Herding has been carried out largely by migratory or semi-migratory herdsmen using traditional practices developed over centuries, designed to accommodate the herder and his herd to the ecological and climatic circumstances in which they live. In the 1950s and 1960s, in order to better exploit these animal resources, governments with donor financial support undertook major livestock development programs primarily oriented towards improved animal health and well construction. In Chad the resources of the Livestock Service in the 1960s were practically doubled by donor inputs for the RP-15 Rinderpest Campaign and major well-drilling programs. However, the improvements resulting from these programs were not accompanied by the development of the mechanisms necessary to ensure that increased numbers of livestock which would therefore graze in the Sahel would not encourage ecological deterioration of limited range and water resources. The government provided no extension personnel for the Sahelian zone other than personnel concern with animal health (primarily vaccination campaigns) and made no attempt to encourage government-controlled or voluntary systems of water and grazing control among the herders. Indeed the basic concepts of range management, a science primarily developed in the U.S., largely for cultural reasons were scarcely known or appreciated throughout the Sahel. No systems for optional utilization of the Sahel in tandem with complementary zones further south were developed.

A major obstacle to the establishment of an effective comprehensive system of livestock production and range conservation in Chad is the present weakness of the Chadian Livestock Service. One major problem has been finance. The share of the Livestock Service in the general government budget fell steadily from 2.29% in 1961 to 1.93% in 1972. This level of budgetary support enables the Livestock Service to do little more than pay the salaries of its regular staff. Funds for travel, vehicle and building maintenance and the purchase of vaccines have been severely reduced. The massive influx of short-term drought assistance will enable the Livestock Service to improve and expand its activities while these funds last, but no long-term plan exists to provide the Livestock Service with a more satisfactory level of operating funds. In fact, in part due to the immediate pressures of the drought, the government, even with the assistance of a 3-man donor-funded Livestock Development Planning Unit, has been unable to formulate a comprehensive long-term livestock development plan for Chad.

The DAP team concurs with the findings of the earlier livestock assessment teams and supports their recommendation that technical assistance to increase the capacity of the GOC to plan and manage its livestock section is the highest priority. AID assistance, provided in conjunction with the UNDP/FAO/IBRD - supported Livestock Development Unit project, is designed to accomplish this objective. The project would not result in an increase in the number of Livestock Service Cadre. The project is entended to provide a re-orientation for existing personnel which would result in establishing a base for the future development of the sector. Funds ($5.0 million) are tentatively programmed for a more extensive production-oriented program beginning in FY 1978.

K. CAMEROON

Development Policies and Priorities

The key to understanding the development strategy of the Government of the United Republic of Cameroon (GURC) is the unique physical and cultural diversity of Cameroon. Physically the country spans the range of eco-climatic zones from rain forest to semi-arid range land. Culturally the country is also divided into differing regions, notably the West, with its British colonial heritage; the Southeast, where French influence was strongest; and the Northeast, where the original immigrant but not traditional Moslem rulers still maintain control.

Until the reunification of 1972, the government was organized along federal lines with almost total separation between east (francophone) and west (anglophone) Cameroon. Each state government was responsible for legislation and administration of taxes, education, agriculture, community services, etc. The Planning Ministry at the national level was weak and economic policies were only generalized statements which were not necessarily reflected in budget or resource allocations. With the creation of a unitary, rather than a federal system in 1972, national planning increased its effectiveness and its central coordinating role. The Planning Ministry also took a greater interest in coordinating external donor plans and programs. The general goal of the Cameroon Development Plan is growth through "balanced liberalism", meaning regionally balanced development, mixed public/private development, and general growth on all sectors as opposed to concentration on one or two.

Among the major principles and priorities outlines in Cameroon's five year development plan, three major ones coincide with AID directions and strategy. These are:

a) reducing regional income disparities and increasing and improving production in food crops and livestock;

b) developing human resources by adapting the educational system to national realities and by emphasizing the training of technical and professional personnel; and

c) assuring coverage of medical services to all Cameroonian citizens, including preventive as well as curative.

Perhaps the most important priority projects in Cameroon's development plan, however, are the expansion of its transport infrastructure system. Heavy emphasis is placed on two major interrelated projects, the Transcameroon Railway (Phase III) from Yaounde to Douala, and the enlargement of Douala Port. AID was a major contributor and played a catalyzing role in the early phases of Transcameroon Railway, now complete from Yaounde to Ngaoundere. The Cameroonians view completion of the transport system as vital to the agricultural development of the north and of crucial importance in promoting the economic and political unity of the country. When completed, this transport system will also be of importance to the economic development of Cameroon's landlocked neighbors, Chad and the Central African Republic.

Due to funding constraints on AID's financing of capital projects, it does not appear at present that AID will be in a position to assist Cameroon in these important priorities. However, considering the importance of this transport infrastructure system to the development of Cameroon and its landlocked neighbors and given that AID is identified with and has played a catalyzing role in the railway, the possibility of an AID input should not be foreclosed if funding contraints on capital projects should ease.

Issues Affecting AID Assistance

1. General

The variety of land use patterns, the changing nature of some elements of current land use and land capability, and the variety of efforts, by both the GURC and by external donors, underway or planned in areas of high potential but fragile ecological base, reinforce the need for a comprehensive land use survey planned by FY 1975. The critical and highest priority problem in Cameroon is to device means to bring population pressures into balance with natural resources. The comprehensive land use-land capability survey will not only highlight specific problem areas, but will also be the first step in defining more natural, less destructive, land use systems.

Environmental and economic reasons related to the differing land use patterns indicate that the long-term, most productive use of the land will depend upon developing integrated and complementary programs for cash/food crop rotation in conjunction with rotation for legumenous forage crops and livestock production. Therefore, although agriculture and livestock are presented separately in the country annex, the program should be conceptualized as a single effort to maximize the effective use and conservation of natural resources. Following completion of the land use survey, a full sector analysis of agriculture in the Cameroon could be undertaken as one part of a revised bilateral DAP submission, if such were required.

2. Strategy

The U.S. strategy for assisting Cameroon to obtain the three above objectives is based on a recognition of the cultural and physical diversity of the country. The proposed strategy involves undertaking programs at the national level in health and human resource development while, at the same time, supporting action programs at the regional level. The regional programs, one in the North and one in the West, will focus on agricultural problems initially but should be viewed as vehicles for developing comprehensive integrated rural development programs. The national programs are considered as supportive approaches necessary for the collaborative development of programs in these two rural area programs. No new programs in health are recommended since the present approach of concentrating on manpower and data development is deemed valid. In human resource development, a major new project, designed to cut across institutional boundaries within the government and to focus on strengthening planning and operational evaluation by in-service training programs, is recommended. Two major action programs designed to reach the regions which have benefited least from prior development efforts are recommended. In both cases, phased financing is recommended in recognition of the fact that significant project planning will be an integral factor during the first years of activity.

3. Reducing regional income disparities and increasing and improving production in food crops and livestock

While there is no severe food problem generally in Cameroon, comparative food scarcities, partly as a result of distribution problems, do exist in major urban centers. The 1972-1973 drought resulted in local food shortages in many parts of the northern province. There is growing, but inadequately documented, evidence that food crop yields throughout Cameroon are declining or at best stagnating because of soil fertility exhaustion and insect and plant pests. Sorghum and millet production in the north were seriously affected by drought. Maize production in the west is affected by competition from coffee and by leaf diseases. In general, the research base for food crops is inadequate and extension services are weak, and extension personnel are inadequately trained and few in number in relation to the number of farmers to be reached. Agents closest to the farm level are handicapped by bad roads, inadequate transportation and logistic support, and small operating budgets. The preliminary thinking is that training, retraining, and equipping agents to carry out activities in food crop production is badly needed. Very important is the fact that the Ministry of Agriculture is currently rethinking the entire approach to extension in order to build a food crop capability. Emphasis would be placed on training and retaining middle and low-level agents, i.e., the Chefs de Poste Agricole and the Moniteurs de Base.

The development of an adequate research base, in-service training for extension agents and the development of effective linkages between the research agency and the extension service would be part of the two rural action programs.

"Educational Reform" in Cameroon is a general preoccupation of government in all areas and at all levels. A general educational reform, initiated after reunification in August 1972, is designed to blend one national educational system out of two historically and structurally different colonial heritages. A more pervasive and development oriented reform is related to bringing the educational system into greater harmony with socio-economic realities. The reform program has several components, the highest priority being given to "ruralizing" the education system. Other components include making technical education more relevant to economic primary level, and expanding and up-grading agricultural education and other reforms at secondary level.

The most talked about educational reform program is IPAR, an institute designed to organize and implement the "ruralization" of primary schools in east (francophone) Cameroon. UNESCO and UNDP funding has been extremely large in comparison to the results produced to date. Benefiting from criticisms that IPAR (east) was too rigid and, ultimately, inordinately expensive, IPAR (west) has been separately designed for west (anglophone) Cameroon. IPAR/west, which is also supported by UNESCO, as well as European donors, is concentrating on a two year research effort which involves studying the physical, biological, and social environment, as well as fostering participation in the process by school personnel, parents, government officials, etc. Action recommendations will be available in FY 1977. These would become one part of the proposed Integrated Rural Development (West Cameroon) project.

Manpower development within the agricultural ministries is, however, a priority requirement. Responsibility for agricultural policy, programs, and projects is still divided among ministries of Agriculture, Livestock and other autonomous agencies (e.g., SODECOTON, the Cameroon Development Corporation, SEMRY, SOCAPALM, etc.). This organizational structure makes it difficult to coordinate activities, particularly those designed to increase staple food production, while pursuing equally legitimate goals of increasing production of export and/or domestic cash crops to improve foreign exchange earnings and the income of farmers. Divisions of responsibility for agriculture policy and programs between the Ministry of Agriculture and the Ministry of Livestock makes it difficult to coordinate activities aimed at associating crop production and animal husbandry. Although a recent World Bank Mission recommended that these two Ministries be combined, early reorganization is unlikely. However, the GURC has recently established FONADER (National Rural Development Funds) with broad responsibility for many economic and social aspects of rural development. Creation of FONADER is a positive step that could contribute to coordination and control of agricultural development activities across the board and deserves donor support and encouragement. Funds ($3.0 million) are proposed for a new project, Rural Development Planning, Training, and Research, which would provide assistance to FONADER, ONAREST, and the Ministry of Agriculture beginning in FY 1977.

It is recommended that AID consider assistance for food crop production in the northern area (sorghum and millet) and in the western area (corn). This recommendation is in accord with high priorities of the GURC to redress regional imbalances and is consistent with the paramount interest of AID to address agricultural problems in ecologically and/or population-threatened zones.

Northern area: Trends of increasing population in both rural and urban areas of the north, the levelling off of yields, and a vulnerability to drought have led the GURC to accord high priority to sorghum/millet production. Results at the IRAT station show that with improved varieties, treated seed, and oxen traction, yields increase from 600 to 1400 kg/hectares. With fertilizer (100 kgs nitrogen and 50 kgs phosphate), yields attain 3,000 kg/hectares. We therefore recommend beginning a program of seed multiplication, seed treatment, seed distribution, and extension assistance. This would be one part of the proposed Integrated Rural Development in North Cameroon for which $20.0 million is being allocated. The extension base will require strengthening for program implementation. The IRAT station at Maroua is the appropriate institution to undertake seed production, multiplication, etc. and, perhaps, to train agents. The possible role of FONADER as project coordinator in financing farm family purchase of draft animals and equipment should be studied.

Western area: Another high priority crop in Cameroon, and a basic element in the subsistence diet in the west, northwest, and south, is corn. Yields are low compared to production possibilities as demonstrated in research trials at Dschang and Galin. Leaf diseases, low soil fertility and competition from cash crops contribute to poor yields. There is considerable interest in corn as a subsistence food, as a source of farm income, and as a potential domestic cash and export crop. Some corn has already been exported to Zaire, Gabon, and CAR. The essentials for a corn improvement program include: 1) multiplication of leaf disease resistent varieties; 2) seed distribution; 3) nitrogen fertilizer; and 4) extension assistance in farm management. Drying for storage is a problem which needs to be considered. Agricultural credit is also needed. Coordinated approaches by the research institute, agricultural services and FONADER would be critical. Funds ($10.0 million) are proposed for an integrated rural development project in the West beginning in FY 1977.

The livestock sector assessment centers on the portion of North Cameroon lying north of the Adamaoua Plateau, an area in which the GURC has specifically requested U.S. assistance. This region has been most adversely affected by the drought but has a good livestock potential. Adequate trained staff, however, are not available for development related activities.

The priority area for program assistance in the livestock sector is the need for a comprehensive survey of land use and land use planning as a prerequisite for program/project development and for a specific manpower training plan. A broader approach to development assistance in the LCBC Serbewel sector is to include range/pasture management and crop/forage production which also seems desirable. Other pilot integrated rural development zones and a livestock sector program in support of specific development activities (to include tsetse eradication, water development, and conservation of land and grazing resources) merit consideration as well.

The identification of specific production related activities in the north is handicapped by the absence of comprehensive land use and livestock development plans, as well as by the wide variation in soils, topography, rainfall, population density, the extent of overgrazing and production/management systems. Most resident livestock are owned by Fulani, Shua Arab, and non-Islamized family groups who are also cultivators of cotton, groundnuts, sorghum, millet and rice. This has favored the fairly widespread adoption of draft oxen/stock farming. The GURC request and terms of reference noted the expansion of agro-industrial crop hectarage, but without adequate provision for the opening of new grazing areas to relieve the overstocking pressure.

Sub-region development priorities differ substantially depending upon present production patterns and the intensity of agricultural cropping and grazing use. In the Serbewel sector and the central portion of the region, severe overgrazing is evident over large areas. The range/pasture resource is deteriorating and crop yields are said to be declining. Programs must concentrate on relieving grazing pressure by closer integration of crops and grazing and, where necessary and possible, by the establishment of community grazing reserves as soil and water conservation measures. Given existing cropping and livestock ownership patterns, integrated rural development programs, which include assistance to both crop and livestock enterprises on individual farms and communities, are required. Assistance in developing an integrated livestock program would be one part of the Integrated Rural Development (North Cameroon) project.

4. Developing human resources by adapting the educational system to national realities and by emphasizing the training of technical and professional personnel

The recommended strategy to be pursued in Cameroon focuses on human resource development problems in general rather than on problems internal to the educational system. The priority need is to support Cameroonian efforts to develop continuing evaluative mechanisms addressing the external efficiency of the system, i.e., the question of how relevant the outputs of programs are to the development needs of the country.

In general, we recommend a human resource development strategy composed of the following elements: 1) give priority to support for in-service training related to other AID projects in Cameroon or in the region; 2) make every effort to respond to those requests which would increase the capacity of an institution/organization to provide training for participants from other countries in the region; and 3) support Cameroonian efforts to develop the capacity to perform operational research on human resource development issues. AID should concentrate on enhancing the capacity of existing organizations to reach target groups at the "grass-roots" level as associated with other AID objectives (farmer training, etc.) rather than seek to develop duplicative delivery systems. The fostering of a continued relationship with ONAREST is a most promising opportunity in this regard.

5. Health: Assuring coverage of medical services to all Cameroonian citizens, including preventive as well as curative

AID is already involved heavily in support of the health sector in Cameroon, which has great potential for successful health programming. This is primarily due to the presence of qualified Cameroonians at many levels, who, with significant external assistance, are expanding health services through a number of innovative programs.

The magnitude of U.S. assistance to health sector activities is approaching the absorptive limits of present infrastructure. At this time, our recommendation must be to concentrate on maximizing the impact of present programs while conducting and maintaining a more comprehensive sector analysis as data becomes available.

GURC health priorities are:

a) to increase the ability of the people of Cameroon to participate in development activities by providing comprehensive curative, preventive and health education services throughout the country;

b) to shift the focus of services from curative toward preventive programs aimed at rural populations;

c) to increase the quality and quantity of health manpower development;

d) to increase the quantity and quality of health facilities;

e) to decrease the morbidity and mortality of diseases sufficiently to raise average life expectancy from 43 to 55 years by 1980; and

f) to promote medical research and data collection.

These priorities were established by the GURC Ministry of Health, which is almost entirely staffed with Cameroonians and which must be commended in spite of usual bureaucratic sluggishness and lack of data, for orchestrating progressive programming in the health sector in the face of severe financial constraints and inadequate support from the Ministry of Planning and Ministry of Finance. During the period of the second plan (1966-1970), the health sector received less than half of its planned budget resources and averaged only 9 percent of the national budget. Although funds received for the period of the third plan (1971-1975) have increased by 87 percent, health's share of the national budget has dropped below 7 percent, and per capita increase has only been 31 percent. External assistance is expected to provide nearly half of the third plan health budget.

The first census to be conducted in Cameroon is planned for November 1975. GURC policy is antimalthusian and the President has expressed a desire, without setting a timeframe, for a population of 10 million to help develop Cameroon. Legislation still exists prohibiting family planning activities, and the GURC delegation to WPC supported the view that the proper approach to population overgrowth was through general economic development. But in spite of the official GURC position, there has been a marked increase in open discussion of family planning in the mass media, government sponsored seminars, and in the curriculae of all levels of health workers. Moreover, the government is not expected to interfere as the National Women Auxiliary of the political party adds comprehensive family planning services to the maternal and child health center in Yaounde. The government is also mounting a serious organization and training campaign to insure the validity of the 1975 census, in sharp contrast to some neighboring countries which try to dictate the outcome of the census before the fact.

The principal constraints which appear to be operative in the health, nutrition, and population sectors in Cameroon are those of scarce financial resources, inadequate quantity and quality of trained personnel, and the absence of data concerning all aspects of health. Financial constraint is most evident in inadequate equipment and materials, poor maintenance of existing facilities, and critical transportation shortages. Manpower constraint is reflected not only in inadequate numbers of health workers, but in existing health workers not being sufficiently trained for their responsibilities. This is particularly evident in the area of administrative, management, and planning skills in upper and middle level workers. The data constraint is through all sectors in which programming must be done with the near absence of hard data. Much of this is due to a lack of basic demographic data.

The AID response to these constraints should, in our view, be directed to manpower and data needs, and should involve nine existing programs and two more under consideration.

a) The University Center for Health Services (CUSS), 625-531: AID is assisting through the provision of maternal-child health faculty members, a grant for hospital construction, and stipends for student and faculty training. This involvement is expected to last until 1979;

b) The Regional Public Health Training Project, 625-510: AID is assisting OCEAC by strengthening its health education department with particular emphasis on projects in the MEFOU and SOU Demonstration Zone (through FY 76);

c) GE-TEMPO Assistance to IFORD in training personnel in demography;

d) DUALABS assistance to the statistics division of the Ministry of Planning in preparation for the national census;

e) The African Health Training Institutions Project, 932-350, is providing education methodology assistance to CUSS and other training programs throughout Africa;

f) The Harvard Teacher Preparation Project is delivering a curriculum development course to CUSS faculty;

g) The CDC epidemiologist which HEW has supplied to OCEAC assists disease surveillance;

h) The Strengthening of Health Delivery Systems Project, 625-904, will provide opportunities for training in management and planning for upper and middle level health workers;

i) Possible support of family planning services at the Women's Auxiliary of the political party MCH Center in Yaounde; and

j) Possible support of a CRS proposal to train rural health agents in North Cameroon (part of the Integrated Rural Development).

L. CENTRAL AFRICAN REPUBLIC

Development Plans and Priorities

In assessing the country's economic problems and development potential, it is necessary to take into consideration the particular difficulties encountered in the decade since independence and the likelihood that these may re-occur. The long-term growth potential of the CAR is considerable due to favorable eco-climatic conditions, significant natural resources and the current positive balance between existing resources and population. This considerable growth potential will be difficult to realize within the short-run and, in the best of circumstances, development will be slow and will take place in the form of unspectacular incremental changes in patterns of life and personal expectations.

As described in the country annex, the CAR working with the IMF has recovered from the severe financial crisis of 1970-71. Parallel changes made by the government - which have enhanced the authority and autonomy of the planning ministry - provide reasonable assurances that the government of CAR is committed to those actions required as a base for effective economic growth and development. The involvement of the UNDP with macro and sectoral planning has substantially increased the effectiveness of planning and project formulation in several key ministries. The UNDP under an extremely capable Resident Representative has also assumed a pivotal role in informally guiding all donor program directions. The personnel and organization for formulating, carrying out and supervising development projects has been strengthened not only because of the assistance provided by UNDP but also because of the participation of Central African personnel in the management training programs of the Pan African Institute for Development (PAID).

These factors, improved financial management, strengthened development planning and donor cooperation under UNDP leadership and enhanced project management capability, taken as a whole, provide an environment in which we believe U.S. assistance would not only be effectively utilised, but would also make a unique contribution. Because of this and because of the Congressional mandate to channel U.S. assistance to those countries and those people who have benefited least from economic growth, we are recommending that the U.S. provide significant bilateral resources to the CAR. Over the first two years of the Development Assistance Program for the CAR, no change in AID management structure will be required; that is, project personnel attached to the Regional Office in Yaounde will have the responsibility for project management. This management structure may well be altered as the DAP is reviewed and revised.

Issues Affecting AID Assistance

1. Selection of Areas of Concentration

Past U.S. assistance to CAR has been channeled through regional

programs in a variety of areas. The DAP team undertook an analysis of the three major areas of concern to AID (agriculture, health, and education) and concluded (1) that there were significant problems warranting AID assistance; (2) that effective programs could be developed in these areas in such a way as to be mutually reinforcing; and (3) that such programs should be undertaken on a phased basis in close collaboration with the UNDP. Adoption of the recommendations summarized in subsequent paragraphs should be clearly understood as being a decision to initiate a significant bilateral program in the CAR over the next five years, provided that the findings of the DAP team are substantiated by subsequent events. The program proposed would be in the range of $10 million for the five-year period.

2. Agriculture (Food Production)

Of immediate concern to the GOCAR and AID are programs to reverse the deterioration and degeneration of seed stock through participation in a UNDP/FAO seed research and multiplication project. Following initiation of this project, AID should explore with the UNDP and GOCAR further ways in which AID can participate in: (1) applied agronomic research on major food crops; (2) production, multiplication and distribution of improved seeds; and (3) improvement of extension services. The total package should be designed to complement the efforts already being made by the UN.

3. Agriculture (Livestock)

Because the CAR has the time to seek solutions, AID has a unique opportunity to foster a logical and orderly concept of animal development in the CAR. At the national and technical levels, however, there is a lack of planning and professional expertise. U.S. assistance should focus on ways in which to augment the professional capacity through external and/or in-service training and on providing selected planners with an opportunity to become acquainted with livestock programs in similar African countries. Initial actions in this field could be undertaken under regional programs; however, we recommend that an Agricultural Manpower Development project be initiated in FY 1977 which would incorporate animal resource development as well as other areas. The Dynamics of the livestock sector would need to be studied in greater depth; programs in this area would evolve over an extended time frame.

4. Human Resource Development

Potential areas for program development in education/human resources include: (1) general requirement for in-service training/retraining of existing middle-level cadres; (2) specific support for the community development training and adult education program; (3) possible support, following one or two years of CAR experience with experimental approaches, for the primary education reform and schools for collective development

(EPC); and (4) assistance to the Ministry of Education, National Institute of Pedagogy, and Ministry of Planning to develop CAR capacity to undertake educational-economic analysis in order to better utilize resources (nearly 20% of budget) currently provided this sector.

In-Service Training/Retraining: Development of the secondary and post-secondary education programs in CAR is expanding faster than the CAR economy can absorb graduates of the system. At the same time, training being received is not readily adaptable to development needs of CAR; as a consequence one important area for external support would be the continuation and expansion of the CAR's participation in regional in-service training seminars such as those sponsored by PAID or organized by relevant regional organizations such as OCEAC, CUSS, or NASA. Alternatively, support could be provided to CAR training institutions such as ENS or INEMS to develop retraining or permanent continuing in-service training programs. Care should be taken that retraining programs be truly adapted to needs/realities of the CAR and are built into the structure of substantive ministries dealing with rural development problems. One such method might be to support the Ministry of Agriculture in retraining the teaching staff of its agricultural training programs in order to develop capacity for permanent in-service training, built on flexible short-term courses, in critical ministries. Such a concept would be an integral part of the proposed Agricultural Manpower Development project.

Primary Education Reform (EPC): This is one aspect of the UNDP-supported project, initiated in January 1974, to assist in developing and implementing reforms of all levels of CAR's education system. Primary education reform would, if effective, be most relevant to needs of rural areas. UNDP, UNESCO, and IFAC are participating in staffing and financing, and the desirability/requirement for additional donor assistance could only be determined after one or two years' operational experience provides a basis for evaluation. Subsequent support, if warranted, might take the form of assisting in retraining primary school teachers. This would be a critical area, since in 1970 2,040 of 2,650 CAR primary school teachers were considered "not qualified" even under the existing French-oriented system. The provision of educational technology related to long distance media teaching might be an alternative avenue of support.

Educational/Economic Analysis: Given the proportion of budget allocated to formal education and the promising alternatives for non-formal options, as well as greater concentration on in-service training, one means of influencing government planning in this sector would be to develop capacity in relevant ministries for the cost-effective evaluation of educational programs. Complementary support for research and program development in adult education, linked to integrated development zones and integrated with community development training programs, would be a significant avenue for external donor support. Of the estimated 650,000 economically active population, 85 percent are in the traditional subsistence

agricultural sector. Services and infrastructure for health care, education, information and transportation are least adequate in these traditional areas.

The optimum area for support of activities which would expand the opportunities for development for people in this sector would be to strengthen and possibly expand the unsupported program for community development training and adult education. This program, under the Ministry of Health and Social Affairs, is providing effective, grass-root training for community development personnel who work at village level. The program which combines two-year training (in the fields of health, nutrition, agriculture) and village assignment with three-year follow-up supervision has been remarkably successful, during its brief life (1972-1974), in involving villagers, students, teachers, and prefects in joint planning/evaluation seminars to assure program relevance.

5. Health

Potential areas for program development in health/nutrition/population include: (1) support for existing training programs; (2) expansion of the demonstration projects already underway; and (3) assistance in the collection and analysis of basic population, nutrition, and health data. Program areas take into consideration the fact that many programs already exist which address health sector government priorities. These programs are emphasizing the training of personnel suited to rural areas and community development through a demonstration health zone at Bimbo. We believe external assistance should concentrate upon these rather than embark on new programs which might exceed absorptive capacity of the Ministry of Health.

CAR health priorities are (1) training of personnel, (2) development of health and social services, (3) maternal-child health, (4) environmental protection, and (5) campaigns against communicable diseases. The DAP team visit coincided with the CAR's National Health Conference, including health practitioners stationed throughout the country as well as regional OCEAC personnel. It is worth noting that while the majority of presentations dealt with tuberculosis and specific disease problems such as cholera and sickle cell anemia, a number of sessions were devoted to preventive and public health issues, including the planning of a national health service and personnel training requirements. In the course of the conference, it was evident that the Health Ministry is effectively addressing some of its priorities.

Given limited resources, specific disease control programs are less feasible than programs such as INEMS (National Institute for Medical-Social Training and Public Health), which is aimed at producing broad-range paramedical personnel to serve in rural communities. This program is directed at providing the rural population with basic information and auxiliary personnel for basic preventive programs. Associated with INEMS is the pilot demonstration zone at Bimbo. This is the location

of a health team partially supported by AID, under the OCEAC/University of Pittsburgh Project. Bimbo is utilized as a practical training ground for INEMS students and could serve as the pilot for the development of a prototype low-cost delivery system, along lines of the DEIDS program, for the entire prefecture including Bimbo.

Basic data in the sector is also priority need. Although there are no recent nutritional surveys, a 1968 WHO study indicates that there is generally an adequate caloric and vitamin intake. Occasional inadequate protein intake reflects the need for nutritional education to better utilize available protein resources rather than absolute protein shortage. Basic nutritional surveys are needed to confirm or reject this impressionistic study.

M. GABON

Development Plans and Priorities

The post-independence history of Gabon has been characterized by growing economic prosperity, based on the exploitation of natural resources by massive foreign private investment under expatriate management. The Government of Gabon is convinced that its future development prospects must be based on utilization of its forests and mineral resources. Governmental investment, therefore, has been, and will continue to be, primarily directed to those supportive infrastructure needs (rail, roads, ports, construction) which facilitate expansion of the important extractive industries. The Gabon Second Development Plan (1971-1975) was dominated by projected investment in petroleum industries, manufacturing, construction, and transportation infrastructure, including the TransGabon Railroad to which highest priority was given. The less than three percent allocated to rural development was directed to the promotion of large scale commercial plantations for cocoa and coffee. Priorities for the Third Plan now in preparation seem unlikely to change, although a great effort will be made to encourage foreign businesses to re-invest within Gabon and to "Gabonize" their management staff.

Issues Affecting AID Assistance

1. Agriculture

The structure of the development problem in Gabon has little, if any, similarity to problems faced by other African countries. Viewed in terms of macro-economic criteria, Gabon's economic growth has been phenomenal; however, the development pattern within the country has been uneven. The growth has been restricted almost entirely to the "modern" enclave areas derived from oil, lumber, manganese and uranium activity. Although over 85 percent of the country is covered by dense tropical forests and less than one percent of the land is under cultivation, it is estimated that 60% to 70% of the population remains dependent upon subsistence agriculture.

The basic development problem which must be addressed by the Gabon Government is the compelling need to foster positive links between the enclave export sector and the rest of the economy. Small scale agricultural projects, e.g., vegetable production, offer a promising mechanism for this type of linkage around cities and centers of mining and timber activities. Although UNDP-supported programs have demonstrated the technical and economic feasibility of such production programs, it appears unlikely that such programs will be continued due to lack of governmental and popular interest and participation. There are severe constraints affecting any agricultural program in Gabon, including: a broadly dispersed rural population; the tendency of healthy (male and female) workers between 18-45 to move to urban areas; lack of adequate transport, credit or distribution infrastructure (for extension or for marketing activities); inappropriate technology; unfavorable soils and vegetation; and governmental policies which favor growth in other sectors. A basic labor shortage would hamper non-capital intensive programs while, at the same time, capital intensive agriculture would probably not provide competitive returns to labor or capital in comparison to alternatives in the enclave/export sector.

Despite the fact that AID, IBRD, UNDP and IMF have identified urban-rural disparity as the critical development problem affecting the majority of the Gabonese population, there appears at this time to be minimal interest in this problem on the part of the Gabon government, either in terms of development policies or budgetary allocations. Therefore, no assessment of the agricultural sector was undertaken and AID is not recommending any assistance in this area during the time period covered by this DAP submission.

AID's proposed Gabon feeder road loan of $5 million is outside the framework of the DAP strategy per se, and will be justified as a "Selected Development Problem" in the loan paper. If the roads could be oriented away from timber evacuation toward one of the UNDP integrated rural agricultural areas, the feeder road program might be a useful supportive mechanism for rural-urban linkages.

2. Health Sector

A separate health sector assessment was undertaken and is included as part of the country annex. Because Gabon's rapidly expanding health budget is removing the usual financial constraint which affects most under-developed countries, it is our belief that Gabon can, if desired, obtain the maximum benefit from existing regional health programs and selected short-term special assistance. The basic Gabonese Health Plan, prepared in 1975, is considered to reflect accurately the primary health problems facing Gabon. Although these priorities are still valid, the preventive programs are dependent upon an adequate data base which does not yet exist. Other activities are hampered by weaknesses in program planning and implementation. Participation in regional activities could

alleviate some of these weaknesses. Funding levels proposed for regional health programs reflect this recommendation.

3. General

The general recommendation for AID assistance programs with Gabon over the next five years is that AID should encourage selected Gabonese to participate in, and take advantage of, existing region-wide educational opportunities in the field of education, per se, through human resource development programs sponsored by the Pan African Institute for Development.; in the field of agriculture; and in the field of health. It should be recognized that changes in governmental priorities will occur slowly and will not be primarily the result of donor influence. External donors can play a useful role in fostering such changes, however, in providing training to Gabonese who might gradually play a leading role in bringing about a more broadly based development pattern.

ADDENDUM

This document was reviewed in AID/Washington in the late Spring of 1975. The following conclusions were drawn.

General Conclusions

- To adopt a modular (incremental) program development strategy, which allows us to address specific problems, disaggregate them into the most immediate constraints, and set to work now, without closing the door to further analysis or other options.

- To accept the important relationship of the interior Sahelian states with their coastal neighbors as a basic premise in our strategy, strengthening our regional programs, using them to strengthen our country-level programs, and vice-versa.

- To concern ourselves with the environmental impact of each and every one of our assistance programs, but particularly the impact associated with livestock activities and river basin and irrigation development.

- To undertake an extended economic analysis with the U.S. professional community of those price, marketing, and monetary policies (especially with regard to the franc zone) practiced in key CWR countries (e.g., Senegal, Mali). We will most effectively address these larger economic policy issues in bilateral and multi-lateral coordination with other donors.

- To ensure that our programs continue to address directly the problems of the poor majority, we will build a data gathering capacity into each project for management purposes.

- To address the key problem of absorptive capacity on the personnel side, we are prepared to assist in the formation and implementation of manpower development plans and long-term approaches to remedy the deficiency of middle- and high-level skills required for development. On the budgetary side, we are prepared in the poorer states to pay local costs on a limited basis and even some recurrent costs where a clear plan exists for the host government to assume these costs within a specific time.

- To support those regional organizations contributing to African multi-national cooperation and facilitating donor investment programs.

Sectoral Conclusions:

Livestock: Of special importance to the area for nutrition and income.

- To continue to study the important relationship of people to livestock to determine response to external factors.

- To continue to refine the stratification strategy which maximizes the potential use of Sahel, Sudan, and Guinea zone for livestock purposes.

- To encourage adequate allocation of African budgetary resources to the livestock sector, proportionate to the contribution of the sector to government revenues.

- To include the greater use of livestock for on-farm power and animal fertilizer as an important part of our livestock program.

Food Production:

- To strike an appropriate balance between extensive (e.g., minimum package dryland farming) and intensive (e.g., river basin development) approaches.

- To work towards the self-sufficiency in food production of the Sahelian zone, which is believed possible despite obvious climatic and other disadvantages. To achieve this end, we stand ready to assist host governments in their reassessment of their price and marketing policies, and their development priorities.

- To help promote the rotation of food and cash crops in areas where the two may ordinarily be in competition.

- To assist in developing and introducing on-farm, improved low-risk technologies which will profit the subsistence farmer.

- To place greater emphasis upon adaptive and local research and on the linkages of that research to the larger regional and international research network which already exists.

Health:

- To assist the reorientation of national health programs towards preventive services (including nutrition and MCH/FP) for the rural majority.

- To help in meeting the need for data essential to improved health planning.

- To find ways (including the posting of health specialists in the area) to collaborate more closely with host country and regional health officials in planning health assistance.

- To investigate additional intervention possibilities in selected fields of disease control, environmental health (including prevention of adverse fall-out from irrigation and other development), etc.

- To assist in the retraining and upgrading of those now in health services, for extension to rural areas.

Human Resource Development (with particular sensitivity to other donor activities):

- To assist non-formal and technical training activities at lower and middle levels which produce skills in our other sectors of interest (livestock, etc.) and which prepare the rural recipients of project assistance to manage and control project inputs.

- To develop training activities to meet skills deficiencies at middle and higher levels of personnel and to do so in concert with long-term manpower projections worked out and approved by host governments and other donors.

- To continue support to change-oriented regional institutions (e.g., PAID, CAFRAD), and to regional participant training schemes (e.g., AFGRAD).

- To conduct more thorough studies of non-formal education and training practices and programs in the area prior to development of a more detailed strategy in the sector.

PL-480:

- To conduct a formal review of the requirement to continue Title II programs, including the implications of food for work, feeding, and nutrition.

Transportation (not a sector of concentration):

- To consider assistance in transport in those cases where transport becomes a serious constraint on our activities in food production, livestock, and health, as an integral part of a U.S.-sponsored project (e.g., rural roads component of Mali Cereals project).

- In exceptional circumstances, in a multi-donor context, to consider transport assistance to break a particularly serious bottleneck.

Population:

- To engage local policy makers in constructive dialogue (and special studies), both to improve our own knowledge of conditions which support high birth rates, as well as to advance host country understanding of the importance of demographic factors for economic development.

- To initiate and implement family planning programs, where possible, both through conventional means (clinics, commodities, education) and "beyond family planning" approaches.