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# Survey of Disaster Preparedness Needs and Development Activities in the Sahel

Prepared for the Office of Foreign Disaster Assistance, Agency for International Development, Department of State, Washington, D.C. 20523.

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November 1981

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This report surveys the major donor-assisted development projects in West Africa's Sahelian region. It identifies disaster preparedness needs and potential opportunities for preparedness activities that complement ongoing and proposed development projects. Seven Sahelian countries are reviewed (Cape Verde, the Gambia, Mali, Mauritania, Niger, Senegal, and Upper Volta).

Drs. Barbara Brown and Francis LeBeau of Development Alternatives, Inc., a Washington-based consulting firm, prepared the survey for the U.S. Agency for International Development (AID), Office of Foreign Disaster Assistance (OFDA) under contract PDC-1406-I-00-1089-00 from September 17 to November 24, 1981. Data gathering took place in Washington, D.C. at AID, the World Bank, and the United Nations Food and Agriculture Organization (FAO) liaison office; and in New York at the headquarters of the United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF), and the United Nations Disaster Relief Office (UNDRO) liaison office.

The authors would like to express their appreciation for assistance from UNDP, UNICEF, FAO, UNDRO, the World Bank, and AID officials. A complete listing of officials interviewed or who contributed material can be found in Annex A.

The study's conclusions and recommendations do not necessarily reflect the views of the organizations and agencies involved, and are solely the authors' responsibility.

Barbara J. Brown
November 24, 1981

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# CHAPTER ONE

# DISASTER IN THE SAHEL

## INTRODUCTION

Natural disasters for most vulnerable developing countries are not isolated, unique, or extraordinary events but an extension of everyday life. Recognizing this concept of disaster vulnerability shifts the focus of coping with disaster from short-term relief to a longer-term disaster preparedness perspective.

Disaster preparedness has been described as action designed to minimize disaster-caused death and damage, and organize and facilitate timely and effective rescue, relief, and rehabilitation.[1] Preparedness is concerned with disaster forecasting and warning; population education and training; and organization for the management of disaster situations, including preparing operational plans, training relief groups, stockpiling supplies, and earmarking necessary funds.

Development planning, introduced with a sensitivity to disaster vulnerability and subsequent need for preparedness, can help mitigate much of a disaster's impact, not only in terms of saving lives and property, but also reducing a relief operation's cost. This study examines the important relationship between preparedness and development, and the role disaster preparedness might play in national and regional development planning.

The survey's principal findings reveal several potential opportunities to introduce disaster preparedness activities in the Sahel. These activities either complement ongoing or proposed development projects, serve to enhance a development project's preparedness potential, or provide a parallel activity with shared goals and objectives. The actual design and specification of a Sahelian preparedness strategy is not included in this study. Moreover, assessing the operational and financial feasibility of the study's recommendations and the preceived need, interest, and support of USAID missions and Sahelian governments is clearly beyond the survey's scope. However, this study does present a variety of preparedness ideas OFDA could consider when defining the parameters of its Sahelian disaster preparedness strategy.

The remainder of chapter one reviews the most serious potential disaster hazards in the Sahelian region, and generally assesses the major problems and constraints in dealing with these situations. The chapter also briefly outlines the recent history of the region's disaster events and current state of preparedness. It ends with an overview of donor assistance to the Sahel in response to disasters and discusses how OFDA's preparedness policy could be integrated into the U.S. development assistance strategy.

Chapters two through eight contain profiles of Cape Verde, Gambia, Mali, Mauritania, Niger, Senegal, and Upper Volta [2]. Each profile briefly describes disaster hazards of major importance in each country as well as the recent history of U.S. emergency assistance. The state of national preparedness and potential preparedness needs are identified and accompanied by a brief description of AID's country development strategy. However, each chapter's primary focus reviews ongoing and proposed development activities of AID, UNDP, FAO, UNICEF, UNDRO, and the World Bank. Sources of information include AID country and regional development strategy statements (CDSS), project papers (PP), and project identification documents (PID), as well as United Nations and World Bank documentation. Recommendations for potential disaster preparedness opportunities relating to these development activities conclude each chapter.

Chapter nine gives a brief overview of regional development projects in the Sahel and discusses recommendations for a proposed regionally-focused disaster preparedness strategy. Chapter 10 contains a summary of survey-produced recommendations.

## POTENTIAL DISASTER HAZARDS IN THE SAHEL

### Drought

Climatic cycle studies suggest the probability of five successive years of general drought affecting most of the Sahel can be expected to occur five times in 100 years. Less serious droughts of shorter duration and affecting more restricted areas frequently occur. Indeed, it is a rare year in which some significant regional area does not suffer from drought.

The 1968-73 drought brought to the world's attention the serious consequences of prolonged drought on the Sahelian region. For Sahelian populations, however, climatic variations punctuated by serious general drought conditions is normal, a condition people have adapted to through the years.

The 1968-73 drought period was perhaps more serious than earlier similar periods because it affected:

- A larger total population;
- A larger urban population;
- A significantly larger urban-rural population ratio;
- A larger animal population; and

- Significantly degraded productive resources.

Sahelian soils are generally poor both chemically and physically. Nitrogen is almost universally deficient, while phosphorous is deficient in most areas. Potassium is generally adequate in supply except for certain crops which are particularly heavy potassium users. Little is known about other element deficiencies. However, as land use is intensified, it is very likely that important deficiencies will appear. The light, sandy soils have little organic matter and low soil moisture storage and supplying capacities. Heavier soils, while having more nutrient elements and better moisture-holding and supplying capacities, are difficult to work with hand- or even animal-drawn tools. By virtue of their position in river valleys and drainage basins, they are also subject to uncontrolled flooding. Many of these soils are highly susceptible to erosion once the natural vegetative cover is removed.

Water is important not only as an element necessary for plant growth, but its ready availability or absence influences settlement as well as animal land use. At the same time, excessive water in river valleys and drainage basins frequently precludes use of some potentially more productive land.

Easily captured water sources for irrigation are few and widely separated. Major water sources--the few large rivers with perennial water flow--are difficult and expensive to develop for irrigation. Given the low technology level for agriculture under irrigation by most farmers, the economic feasibility of major irrigation is very questionable.

Readily available ground water, usually sufficient only for human and animal consumption, is frequently unreliable. As a consequence, a substantial amount of human effort is consumed in hauling water from distant sources while large areas of range lands cannot be exploited due to lack of water for animal consumption.

As a consequence of these basic resource deficiencies, extensive production systems have evolved imposing severe limits on the permissible resource/population (human and animal) ratios. Evolving over time, the traditional system of shifting crop production, where three to four years of cropping is alternated with 10 to 15 years of fallow, was an effective use of existing resources. However, as populations increased, the fallow period has gradually been reduced to the point where it has little or no soil regeneration impact. Consequently, there is considerable evidence that a general loss of fertility has and is continuing to occur, especially in the more heavily populated areas such as the Senegalese Groundnut Basin, the Voltaic Mossi Plateau, and the narrow strip of arable land in Niger lying between a 400 to 600 mm rainfall range. This trend will continue as pressure on the land

increases. Solutions involve using chemical fertilizers, changing the production system, or both. The former's high cost and the increased land and labor inputs of the latter promise no easy near-term solutions.

Another result of heavy population pressure on arable land is accelerating water and wind erosion on continuously cultivated land without adequate control measures. Moreover, extending cultivation to more marginal land (marginal particularly in terms of rainfall amount and distribution) also increases drought hazards.

These combined conditions have also affected livestock production. Based on an extensive semi-nomadic system, herds graze in lower rainfall areas during the rainy season and move into arable land areas during the dry season. This well-established pattern is as much due to the need for water for animal consumption as it is to secure forage. The grazing system, effective under low human and animal populations, has become severely constrained as the animal population increased and crop production intensified, the latter reducing fallow areas and increasingly expanding into former range land. Thus continued population growth and declining resources can only aggravate the impact of deficient and irregular rainfall.

Nevertheless, there is potential to expand the effective resource base in several countries with areas of low population and underutilized land. In most cases, these areas are in regions of higher and more reliable rainfall. However, two endemic diseases, onchocerciais and trypanosomiasis, inhibit agriculture's expansion into such areas. Onchocerciasis is particularly important in preventing human settlement where it is prevalent, while trypanosomiasis limits the use of tse tse fly-infested areas for animal production. Limiting animal use for draft purposes may also affect crop production.

Trypanosomiasis has another important impact as well. During periods of "normal" or more favorable rainfall, livestock movement from the more arid range toward wetter areas is usually halted at or before reaching tse tse fly-infested areas. During droughts such as the 1968-73 period, livestock must be moved deeper into higher rainfall and tse tse fly-infested areas. Many animals were thus lost or killed prematurely due to trypanosomiasis.

Together these two diseases preclude or seriously limit using some of the region's better land and water resources for both crop and livestock production.

Lack of rainfall, poor soil quality, and population growth all serve to heighten drought impact. The concentration of increased population in urban areas has also helped to exacerbate drought effects.

Until two or three decades ago, 90 percent of most of these countries' population was rural. Moreover, most of the urban population still maintained links with its extended rural area family. Rural relatives not only helped produce food for their urban family members but also stored a one-to-two-year food supply they could draw on in the event of crop failure.

However, as urbanization intensified during the past 20 to 30 years, it became necessary for the rural population to produce a larger surplus. At the same time, the extended family system began to break down. Thus the urban individual--especially younger migrants--more typically lacks a food-producing family and has to rely on marketed surpluses. Since regional farmers generally do not produce basic foods for the market but market only surpluses, the urban demand on these surpluses has become more acute. The effect of a higher urbanization rate and extended family breakdown, therefore, has been to aggravate an already tenuous food supply situation and increase the risk and impact of drought.

Most of the Sahelian governments have adopted a policy of controlling grain crop marketing by fixing prices at the farmer and consumer level. National cereals offices (such as OPAM in Mali, OFNACER in Upper Volta, OPVN in Niger, and ONCAD in Senegal) are usually responsible for managing marketing and distribution of both locally produced as well as imported basic foods[3]. Limited private sector involvement is allowed through a trader licensing system. More recently there has been a tendency to relax government control in favor of the private sector. However, actual private trader participation remains low.

The price fixation and control system has failed in most instances to achieve its objectives--protecting the consumer against speculation and excessive prices and guaranteeing a support price to the farmer. During periods of scarcity, parallel markets develop with consumer prices frequently reaching as much as 100 percent above official prices. Generally the cereals offices' inability to procure, transport, and store grain during the heavy supply period at harvest has resulted in farm gate prices substantially below official levels.

The financial security of these autonomous cereal offices has generally remained in jeopardy since they are frequently compelled to sell grain to the consumer at less than cost. Together with heavy losses sustained in storage and distribution, this makes the offices seriously indebted and gravely compromises their emergency response effectiveness.

There are also several chronic insect problems affecting grain food production. Although there are no good estimates of insect-caused grain losses, traditional control methods and natural parasites usually prevent very heavy losses.

However, two insect problems present extraordinary hazards: army worm invasions and desert locusts. Invasions of either pests can cause heavy if not total losses, and combatting them is generally beyond the local population's abilities.

The national plant protection services are usually mobilized to combat invasions of these pests. By borrowing personnel, and vehicles from other agricultural services, the plant protection services are usually able to mount effective programs on a limited scale. More serious impediments to the success of such campaigns include a lack of equipment such as sprayers and dusters, and a lack of suitable insecticides.

Control on a regional scale is most effective for the desert locust, a migratory pest whose origin and invasion paths are well known. By striking at the locust in the principal areas of initial reproduction in the Horn of Africa, serious development and invasions of other areas can be avoided.

Losses from birds just before harvest can also be substantial. Farmers use a variety of means to drive the birds (principally Guela Guela) from their fields. However, these methods are ineffective in stopping large bird populations which can quickly consume and destroy most grain in a given field. Bird populations can be reduced by striking at their roosting and breeding grounds.

In the traditional harvesting and on-farm or village grain storage systems, losses are usually kept at a relatively low yet not inconsequential 5 to 10 percent level. Reducing these losses by 50 percent could frequently make the difference between a food deficit or an adequate supply.

On the other hand, commercial storage losses, usually from state or parastatal entities, are usually in excess of 20 percent and frequently reach 30 percent or more. On an annual turnover basis, only about 20 percent of all basic food grains pass through commercial channels. The heavy losses from this amount, however, may well surpass 5 percent of total consumption requirements.

While these losses are chronic and have become more or less accepted within the context of essential food self-sufficiency, they have important implications for programs to establish security stocks.

## Epidemic

Sahelian health conditions are among the world's worst. Malnutrition is widespread, preventable infectious diseases common, and a wide variety of parasitic diseases endemic to the area. Major debilitating diseases in the Sahel are malaria, meningitis, measles, and intestinal diseases with some

concentrated zones of schistosomiasis, trypanosomiasis, and onchocerciasis. Programs to control these diseases are complex, expensive, and currently beyond these countries' means.

Regional health conditions have changed little in the past 20 years. Average Sahelian life expectancy is less than 40 years and infant mortality rates are significantly higher than in other developing countries (Table I-1). Sahelian health infrastructure is very weak compared to other low-income countries. Although health care access has generally improved over the past 20 years, actual improvement is minimal compared to need since rural health services reach only about 20 percent of the rural Sahelian population. Only 25 percent of the region's entire population has access to potable water (Table I-2). However, the single most important cause of poor health in the Sahel is malnutrition. This is a particularly critical fact of life affecting children, pregnant and lactating women, and the elderly, who are especially vulnerable. The caloric intake in all Sahelian countries is less than the FAO/World Health Organization (WHO) minimum daily recommendations, except for the Gambia and Senegal. This situation has worsened since 1960.

Principal constraints to alleviating Sahelian health crises and the uncontrolled outbreak of disease include the lack of effective infrastructure, human and material resources, baseline demographic and nutritional data, disease monitoring and surveillance systems for early warning of threatening health conditions, and potable, disease-free water. In addition, the Sahel's vast land area, scattered village and nomadic populations, difficult Sahelian and desert terrain and climate, and poorly developed communications and transportation infrastructure pose severe obstacles to developing and maintaining effective health delivery systems and disaster relief operations.

A review of critical health situations requiring international emergency assistance during the past 15 years reveals that epidemics of yellow fever, meningitis, and measles are common in the Sahel. Given the magnitude and recurring nature of health problems, a preventive medicine approach to Sahelian health is entirely consistent with disaster preparedness. A disaster preparedness strategy might include institution building and human resource development to help governments more effectively identify potential hazards and deliver emergency assistance when health emergencies arise. Health education and community development can reduce most of the preventable transmissible and infectious diseases. However, until efforts are directed at removing environmental sources of infection, it is unlikely the Sahelian people's health will improve, and there will be a continued need for disaster preparedness.

Table I-1. Physical Quality of Life Index (PQLI[a])

| | Life Expectancy at Age One (years) | Infant Mortality Per 1,000 Live Births | Adult (15 years+) Literacy Rate (Percent) | PQLI |
|---|---|---|---|---|
| Cape Verde | 50 | 105 | 37 | 45 |
| Chad | 38 | 160 | 6 | 18 |
| Gambia | 40 | 165 | 10 | 21 |
| Mali | 38 | 188 | 5 | 14 |
| Mauritania | 39 | 187 | 11 | 18 |
| Niger | 39 | 200 | 5 | 14 |
| Senegal | 40 | 159 | 5-10[b] | 21 |
| Upper Volta | 38 | 182 | 5-10[b] | 16 |
| Sahel Regional | 38 | 177 | 7 | 18 |
| All Low-Income Countries | | | | 40 |
| All Countries in World | | | | 65 |
| United States | | | | 95 |

Source: Overseas Development Council, Agenda 1979, p. 132:

The PQLI combines three indicators - infant mortality, life expectancy at age one, and literacy - into a single composite index. Each of the components is indexed on a scale of 0 (the most unfavorable performance in 1950) to 100 (the best performance expected by the end of the century). The composite index, the PQLI, is calculated by averaging the three indices (life expectancy, infant mortality, and literacy), giving equal weight to each of them.

a/ The United States and World Development: Agenda 1979 (Overseas Development Council, pp. 156-159, 1979).

b/ Weighted average by population, using literacy rates of 10 percent for Senegal and 7.5 percent for Upper Volta.

Table I-2. Nutrition and Health Status in the Sahel

| | Percent of Minimum Daily Caloric Requirement[a/] | | Daily Protein Intake in Grams[b/] | Population Per Physician | | Population Per Nursing Person[c/] | | Percent With Access to Potable Water[d/] |
|---|---|---|---|---|---|---|---|---|
| | 1961-65 | 1973-77 | 1976 | 1960 | 1974 | 1960 | 1974 | 1974 |
| Cape Verde | - | - | - | - | - | - | - | - |
| Chad | 98.8 | 76.7 | 60 | 70,000 | 44,370 | - | 6,990 | 26 |
| Gambia | 92.7 | 96.8 | 58 | - | - | - | - | - |
| Mali | 86.3 | 75.1 | 64 | 39,000 | 33,000 | 1,490 | 2,480 | - |
| Mauritania | 86.5 | 79.2 | 62 | 30,000 | 17,770 | 7,130 | 3,790 | - |
| Niger | 91.1 | 80.6 | 62 | 71,000 | 41,060 | 8,800 | 4,840 | 27 |
| Senegal | 90.4 | 95.0 | 67 | 35,000 | 15,360 | 4,410 | 1,920 | - |
| Upper Volta | 82.0 | 76.4 | 59 | 100,000 | 59,570 | 4,370 | 4,520 | 25 |
| Regional | 88.9 | 80.9 | 62.3 | 62,092[d/] | 38,048[d/] | 4,602[e/] | 3,989[d/] | 25.9[f/] |
| Low Income Countries | - | - | - | 37,000 | 21,185 | 4,515 | 6,710 | 25 |
| Middle Income Countries | | - | - | 3,050 | 2,430 | 2,235 | 1,570 | 52 |

Sources:
a/ Figures derived from FAO-established minimum daily requirements in 1978 Global Assessment Report to Congress (U.S. Department of Agriculture, 1978).
b/ Table III, World Military and Social Expenditures 1978.
c/ World Development Report, 1978 (IBRD, 1978).
d/ Weighted average (for year) for six countries.
e/ Weighted average (for year) for five countries.
f/ Weighted average (for year) for three countries.

## Fire

Yet another constraint to rural area agricultural production is fire. However, its occurrence is so common as to essentially remove it from hazard categorization. The most common types of fire are those in range and scrub forest areas.

Burning grasslands is a common practice throughout the area to destroy old and unedible vegetation. This is usually followed with the first rains by a growth of succulent forage acceptable to livestock. It is also common to burn fallow land intended for cultivation the following season.

However, grass and fallow land fires frequently get out of control and invade forest areas, fallow lands not intended for cultivation, and occasionally even villages.

The effects of burning land are hotly debated. There is little doubt that range land forage growth is better if burning does take place, but whether burning adversely affects the soil itself is debatable. Perhaps the greatest harm occurs when fire escapes into wooded areas. Not only is valuable fuel lost, but soil damage may also occur since forest fires are hotter than grass fires.

Loss from fire in the villages is rare. As a rule there is little combustible material immediately around villages and towns since such materials are eagerly collected for fuel. Village livestock foraging also limits the growth of excessive grass vegetation.

Fire is a chronic problem frequently resulting from human action. It is also seasonal, occuring toward the end of the dry season, and, therefore, predictable. Governments usually attempt to protect forested areas and, to a lesser extent, range lands with fire breaks cleared of plant materials. This practice is frequently questioned since areas to be cleared are substantial and clearing may destroy as much as is saved--especially since the rural population will frequently burn the protected areas as well.

## Flood

As is typical in many regions, intense downpours of short duration frequently flood small streams, natural drainage ways, man-made drainage systems, and, less commonly, large rivers due to high water run-off rates from largely barren land. This has been accentuated by destroyed forest areas and reduced fallow lands.

Although flood-caused rural area property losses are relatively small, losses to infrastructure--roads, water retention and diversion works along streams and drainage basins, soil and water conservation structures, and protective dikes for

cultivated areas--can be substantial. However, there are no estimates of the size of such destruction. The overall magnitude is probably relatively small, although for the areas affected, the losses are undoubtedly very important.

Unseasonal flooding can also destroy crops. In many locations along streams, flood recession crop production is practiced. In other seasonally flooded basins, crops are produced in rhythm with the area's flooding and drying-out cycle. When the more or less normal flooding and recession cycle is altered, crop loss may result. Failure to flood can also have the same effect.

However, such losses are usually localized. Local rain storms do not usually affect the extensive areas along major rivers where flood recession crop production is practiced. On the other hand, a protracted drought over large areas, as in 1968-73, greatly reduces flood recession crop production.

## Storm

Other than rain storms, the most common storm is the harmattan--strong hot desert winds during the February through April dry season. These storms blow vast amounts of fine soil for many miles, frequently reaching the Gulf of Guinea. Aside from damaging soil loss, wind-driven soil and sand interfere with air transport and cover highways and roads. In certain areas windbreaks must be established to protect recently constructed or improved roads. Wind-blown sand also adversely affects crops, especially orchard crops. Moreover, wind storms' adverse effects have been worsened by the same land-use practices that increase the negative impact of floods.

## Constraints in Handling Emergencies

Sahelian countries face a variety of constraints in handling emergencies that stem from the region's principal characteristics. These include: the population's largely marginal existence; the marginal state of physical infrastructure, including transport and communication systems; and institutional weaknesses.

Most of the population maintains such a marginal existence that it has limited reserves to deal with the unexpected. Yet the population has also demonstrated a tremendous resiliance to adverse events. Certainly the population has suffered, but it has also survived. This is particularly true with the sedentary rural population. When faced with adversity, it simply accepts it somehow continues. Even during the 1968-73 drought, probably the most adverse period since the drought of the late 1920s, early 1930s, and World War II period, the sedentary rural population was hardly worse off than normal, although it received little of the international assistance flown elsewhere into the region. The rural population subsisted on its limited production supplemented

with stored reserves. Exceptions occurred in Niger and Mali's northeastern region where crop failure was almost total.

The two groups chiefly at risk were the urban and nomadic populations with the nomadic and semi-nomadic populations suffering the most. This occurred largely due to their dispersion, organizational limitations, and the logistics of distributing emergency foods and materials.

The region's marginal infrastructure also severely constrained the Sahel's ability to handle its various emergencies. Although four of the eight Sahelian countries have ocean ports, the rest are land-locked. Their major population centers are reached only after traveling 1,000 kilometers or more of road, railroad, or both, generally of poor structural and operational quality. These countries must also depend on neighboring countries' port facilities that are already heavily taxed by the normal volume of freight.

Whether port-blessed or land-locked, all these countries suffer from poorly developed and costly-to-operate internal transport and communication systems. Only major population centers are connected by all-weather roads. Inter-country all-weather roads and rail connections exist only between land locked countries and their adjoining coastal neighbors. In most countries the few private transport facilities limit activity to more accessible regions, leaving more remote areas to the public transport services' coverage. Such transport systems are usually operated by public organizations with vertically structured responsibilities. As a result, one-way hauls are the rule, producing excessively high freight costs. These organizations also suffer from poor management and a heavy bureaucracy. In most cases, the transport facilities cannot handle the amounts of food imports needed during a major drought.

Nor can food grain storage facilities (excluding traditional on-farm storage) accommodate even 10 percent of the area's food requirements. These facilities are most frequently concentrated in the capital cities. There are few substantial storage facilities in grain production areas. Farmers usually maintain a one to two year or, and in some cases, three to four year grain supply in their traditional storage bins. Even after the recent severe drought, grain stored for as long as three years could be found in isolated communities.

Not only is the physical capacity to store grain inadequate to meet overall emergency conditions, but losses substained in modern storage facilities are also particularly heavy: a 20 to 30 percent loss is not unusual. By comparison, traditional on-farm storage losses are estimated to be only 5 to 10 percent.

Institutional weaknesses also constrain emergency preparedness. One of the more critical institutional weaknesses

related to an emergency situation is the lack of effective data collection and information systems. This stems in part from the lack of the system itself, as well as the lack of adequately trained personnel and effective communication systems. Local administrative and technical personnel are also reluctant to report less than satisfactory results from a food production campaign. As a result, impending food production deficits or even actual deficits are not recognized until the situation has reached such serious proportions that emergency and costly solutions are required.

Recognizing that a six-month minimum may be required to make up most countries' deficits from off-shore supplies and limited local storage, major crop failure must be forecast by mid-year to permit mobilizing additional food supplies before food deficits seriously affect the population. None of the countries has such a capacity. In most cases, production estimates are not available until well after harvest completion.

Another data problem is the lack of information on traditionally-stored farm and village stock. This information is very difficult to obtain. Farmers' distrust of government makes them reluctant to provide accurate information on individual and community stocks. They also fear governments will, in case of emergency, commandeer stored grain as was reported several times during the 1968-73 drought.

Other institutional constraints include weaknesses in the government and parastatal organizations, and weaknesses in local or traditional organizations. The first reflects the broader problem of organizing and managing governments and parastal organizations in general. Few adequately trained personnel are available and these usually have limited experience. It is not surprising that local personnel are so deficient in these respects since expatriate personnel made most administrative and management decisions until only 20 years ago. As a consequence, mismanagement and even corruption is common. This is especially apparent during emergency situations when timing and sequential flow of actions is so important.

Perhaps equally serious in considering emergency action administration and management are the very limited capacities of traditional and new organizational structures such as cooperatives which have recently been imposed upon the rural populations. Although cooperatives have been established in all Sahelian countries, presumably as population-based and- managed structures, in practice they are largely managed by government services and do not constitute vehicles for local participation in decision making or implementation. Moreover, local traditional organizations play only limited roles as both information sources and participants with government in developing and implementing programs. Instead, they continue to act out traditional roles in allocating land resources, local level social security, and in ceremonies.

In several countries (Mali, Niger, and Senegal) an increasing effort is being made to shift more and more of the responsibility for cooperative decision making and management to the rural membership (population). This could increase direct population participation in development and related programs. The rural population's low literacy level, however, seriously constrains this move. Some countries are actively pursuing programs of functional literacy for cooperative leaders and membership--especially Mali and Niger.

## U.S. Disaster Assistance to the Sahel

The United States has provided disaster assistance for drought in at least one Sahelian country during 10 of the past 15 years. More than $300 million in disaster assistance has been given to this area since 1966. Drought has affected at least half of the region's total population during the past 15 years, requiring over $70 million in U.S. assistance alone.

The second most frequent disaster is epidemic (primarily meningitis, yellow fever, and measles). Tables I-3 and I-4 rank the most important disaster hazards in the Sahel by type and country. This numerical ranking shows a combination of factors must be considered when selecting disaster preparedness strategy priorities. A more detailed breakdown of this information reveals that Senegal is the most disaster-prone Sahelian country in terms of frequency, while Niger, in general, may experience more severe crisis situations. A discussion of each country's potential disaster hazards is found in the following chapters. Table I-5 presents a regional analysis of U.S. disaster assistance to the Sahel by type of disaster and country, with data on disaster severity using the DKM (disaster magnitude) scale.

# DISASTER PREPAREDNESS IN THE SAHEL

Sahelian disaster hazards have been studied intensively. Some countries have received technical advice on various aspects of disaster preparedness and organization. Most have sent delegates to regional and international seminars on subjects related to regional disaster hazards. There is a widespread awareness and special appreciation for the recurrent nature of Sahelian drought disasters. Drought-producing conditions are very complex, and the generally low level of Sahelian development makes preparedness particularly challenging.

In 1976 only Mauritania and Upper Volta had both a national disaster plan and a national-level disaster organization. Mali, Niger, and Senegal had national disaster organizations, but Cape

Table I-3. Ranking In Order of Magnitude of Sahelian Disasters[a] (by type) 1964-81

| | Frequency | Severity[b] | Number U.S. Aid | Number Killed | Affected |
|---|---|---|---|---|---|
| Drought | 1 | | 1 | 1 | 1 |
| Epidemic | 2 | | 2 | 2 | 5 |
| Floods | 3 | | 5 | - | 4 |
| Storms | 3 | | 6 | - | 6 |
| Power Shortage | 3 | | 3 | - | 2 |
| Civil Strife | 3 | | 4 | - | 3 |

aExcludes Chad

bSeverity is calculated on the basis of average DKM

Source: U.S. Foreign Disaster Assistance Summary printout, no date.

Table I-4. Ranking In Order of Magnitude of Sahelian Disasters[a] (by type) 1964-81

| | Frequency | Severity[b] | Number U.S. Aid | Number Killed | Affected |
|---|---|---|---|---|---|
| GAMBIA | 5 | | 6 | 4 | 4 |
| MALI | 3 | | 1 | 1 | 5 |
| MAURITANIA | 4 | | 4 | 6 | 2 |
| NIGER | 2 | | 2 | 3 | 5 |
| SENEGAL | 1 | | 5 | 5 | 1 |
| UPPER VOLTA | 2 | | 3 | 2 | 3 |

aExcludes Chad

bSeverity is calculated on the basis of average DKM

Source: U.S. Foreign Disaster Assistance Summary printout, no date.

Table 1-5. U.S. Disaster Assistance in the Sahel

(1964-1981)[a]

| Country | Drought | DKM[b] | Declared Disaster Years | Epidemic | DKM | Floods | DKM | Storm | DKM | Power Shortage | DKM | Civil Strive | DKM | Total Ave. DKM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gambia | $ 621,925 | 4.0 | 66, 68-70, 77-79, 80 | $ 49,499 | 2.0 | $ -- | -- | $ -- | -- | $ 83,145 | 6.0 | $ -- | -- | 4.0 |
| Mali | 65,074,300 | 5.0 | 66, 69-75, 78-79, 81 | 112,200 | 2.6 | -- | -- | -- | -- | -- | -- | -- | -- | 4.5 |
| Mauritania | 34,027,089 | 6.8 | 64, 69-74, 76, 78 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.8 |
| Niger | 58,191,000 | 5.5 | 66, 69-75 | 33,973 | 3.0 | 25,971 | 4.0 | -- | -- | -- | -- | -- | -- | 4.5 |
| Senegal | 32,413,556 | 6.0 | 64-66, 69-74, 77-79 | 72,240 | 2.0 | -- | -- | 5,000 | 2.0 | -- | -- | 69,805 | 2.0 | 4.2 |
| Upper Volta | 50,501,249 | 4.5 | 66-67, 69-75, 77, 79, 81 | 160,477 | 3.2 | -- | -- | -- | -- | -- | -- | -- | -- | 4.0 |
| Regional | 70,769,000 | -- | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOTAL | | | | $328,289 | | $25,971 | | $5,000 | | $83,145 | | $69,805 | | |

[a] No figures available for Cape Verde

[b] Disaster magnitude scale which ranks events according to the sum of weighted points assigned for the number of deaths (1-10 points for 1-1.5 million dead, number of victims (1-8 points for 1-246 million victims) and monetary damage (1-6 points for up to $2.34 billion). Serious events have usually totalled 11-15 points and major events 16-24 points.

NOTE: DKMs may actually be higher than reported since data needed to calculate DKM is unavailable on several reported disasters.

Source: U.S. Foreign Disaster Assistance Summary, OFDA, 1981 and "OFDA Disaster History List for Gambia, Mali, Mauritania, Niger, Senegal and Upper Volta", 1981.

Verde and Gambia lacked any centralized preparedness planning and organizational authority (4).

The individual national disaster preparedness capabilities will be discussed in the following chapters.

## DEVELOPMENT STRATEGY IN THE SAHEL

All of the Sahelian governments' development plans seek economic growth through agricultural-based strategies. Food and agriculture targets aim to increase production by 4 to 5 percent each year, about double past rates. The other major objective is food self-sufficiency. For most of the landlocked countries, this means increasing millet and sorghum production, while Senegal, the Gambia, and Mali place heavy emphasis on rice production.

This marks a major shift in Sahelian agricultural development strategy. Prior to the drought in the early 1970s it was assumed development depended on export crop production. The drought conclusively demonstrated that Sahelian food supplies had become increasing precarious due to growing population, erratic weather, and government policies which favored export crops with a guaranteed market, better research, better extension and information services, better input supply, more credit, and so forth. Many observers seriously question the objective of food self-sufficiency. They point out such a goal primarily serves the Sahelian governments' interest by assuring a constant food supply for the politically active urban population, as well as relieves the donor community's responsibility to make up food deficits. Farmers who must produce the food really have no incentive for achieving food self-sufficiency on a national scale. Their primary purpose is family food sufficiency, a condition generally satisfied, and beyond that to increase their cash income, but food production has not traditionally been a good cash income generator.

Current government food production strategy also recognizes the hazards of rain-fed crop production by emphasizing irrigation's expansion. The Sahelian irrigation potential is an estimated 1.5 million to 1.75 million ha. Currently some 250,000 ha are under irrigation, only 40 percent of which are equiped for complete water control.

However, developing irrigation is costly ($5,000 to $15,000 per ha). Moreover, the effectiveness of irrigated lands once developed is very low. Yields for irrigated crop production are low by most standards, and multiple cropping occurs far less than is potentially feasible. Maintenance of developed facilities has been very poor, and expensive rehabilitation is usually required after only 10 to 15 years of use. In addition, the countries'

technical capabilities to develop new irrigation facilities and train farmers in irrigated farming are very limited. Securing financing for such expensive developments is also an important constraint.

Until recently, Sahelian irrigation development had focused most heavily on developing large systems based on major water sources and mechanized land preparation. This approach has proven to be very costly, difficult to manage, and faces indifferent to negative farmer acceptance. Overall, irrigated farming has fallen far short of expected productivity levels.

More recently, Sahelian governments have begun to focus increasingly on small village perimeter irrigation systems which AID has favored all along. In shifting the focus, the objective is to reduce the development authorities' role, especially in managing and operating the production unit, and give the farmers, usually acting as groups, decision-making and operational responsibilities.

While insisting on the need to develop irrigation as rapidly as possible, Sahelian development strategies nevertheless recognize that for the rest of this century, food production must come largely from rain-fed crop production. This strategy focuses on intensifying production by increasing land productivity yields. This is to be accomplished by applying improved technology--better crop varieties and cultural practices, use of fertilizers, pest control, and better land preparation (animal traction).

Each of the Sahelian countries has launched extensive productivity projects, largely with donor financing, to seek increased yields and production through improved technology. These involve major efforts to strengthen the countries' institutional capacity to provide extension, credit, seed supply, and marketing services as well as financing major inputs such as fertilizers, pesticides, tools, and implements.

An overall appraisal of these programs has not been done. However, as more and more individual projects have been evaluated, it has become clear the potential for increasing yields and production through existing known technology has been greatly overestimated. One consequence has been the failure to achieve projected yields and production by substantial margins. Another has been an increased emphasis on research, especially by the donor community. This shift recognizes the limited ability to transfer technology as well as lack of effective applied research for producing technology packages adapted to farmer conditions.

Since the drought, another major governmental goal has been reconstituting national herds. Sahelian countries suffered major herd losses during the drought and view a return to pre-drought herd levels as critical to assuring adequate meat supplies for

urban areas and foreign exchange through exports. The number of cattle that perished is estimated at 20 to 50 percent of pre-drought levels in Mauritania and Niger, 20 to 40 percent in Mali, and 10 to 20 percent in Upper Volta. However, the percentage of livestock loss given is probably an exaggeration if loss means death from starvation and dehydration. Perhaps more important than loss from death was the sustained consequence of premature or forced marketing to avoid eventual starvation. This practice greatly depleted the herds but yielded little cash since animals were sold at very low prices. In addition to reconstituting herd stocks, government strategy also seeks to better integrate farm-level animal and crop production.

Parallel with efforts to rebuild national herds, most countries are also undertaking programs to improve range land management. This has the twofold objective of increasing range grass productivity and reducing range degradation.

Sahelian government policies concerning health, education, industry, and other sectors have less priority than agricultural strategies in national development plans. Although rural health is given a relatively greater emphasis, Sahelian governments have not yet provided substantial funding to tackle the deep-rooted problems of regional rural health care. In fact, the drought changed the way governments and international donors viewed the region's development problems in a major way. It was responsible for shifting a whole range of development priorities slowly away from focusing exclusively on urban to that of rural areas.

## The CILSS-Club Framework

Catalyzed by the drought and the perception that mutual concerns and problems could be more effectively addressed on a regional level, the Sahelian governments formed the Permanent Interstate Committee for the Fight Against the Drought in the Sahel (in French, CILSS). CILSS was originally created to mobilize emergency assistance and help coordinate drought relief efforts. Since that time, it has assumed broader functions and has primary responsibility for coordinating longer-term development assistance and planning regional programs.

The Club du Sahel is an organization of donors and CILSS member states responsible for forming strategies to address major development problems facing the Sahel and mobilizing external financing for regional development programs. CILSS and the Club are companion organizations with secretariats in Paris and Ouagadougou. They work in concert to analyze Sahelian development problems and propose strategies for their solution.

The CILSS/Club program goals are to achieve food self-sufficiency and eventual self-sustaining growth and development.

Food self-sufficiency is clearly the highest priority, and reduced drought vulnerability with self-sustaining growth and development represents a long-term goal.

The CILSS/Club du Sahel health strategy promotes the linkage of development activities in other sectors. Thus many health activities are found in agricultural and water development programs. Linking health programs with water development deserves special mention since the relationship between health and water is so strong, particularly concerning parasitic diseases such as schistosomiasis, malaria, filariasis, onchocerciasis, guinea worm, trypanosomiasis, and hookworm disease.

CILSS and the Club work together to coordinate the Sahel development program, but generally do not either administer programs or negotiate specific country projects. Each donor develops specific projects and then negotiates bilaterally with individual Sahelian governments. Therefore, most of AID's Sahelian assistance follows the normal programming procedures of designing and implementing bilateral country projects.

Given the food self-sufficiency and self-sustaining growth goals, the Sahel regional CDSS lists six objectives AID is pursuing over the next decade:

- Increase agricultural production using proven technologies;
- Develop the infrastructure base related to agriculture;
- Strengthen institutions and train manpower needed to achieve sustained agricultural increases;
- Halt the deterioration of the natural resource base and develop energy sources;
- Improve rural area preventative and curative health services and initiate population planning where possible; and
- Develop the human resource base through mid-level training and functional education in rural areas (5).

AID interprets food self-sufficiency as a long-term prospect for the region as a whole. This means the Sahelian countries as a group should produce enough food to feed the region's total population. During years of good rainfall and high productivity, buffer stocks will be established to be drawn down during low rainfall years. Implicit in a regional as opposed to a national self-sufficiency goal, is the assurance that any country

experiencing a deficit would have the means to obtain and distribute food to deficient areas. This interpretation is what AID means when referring to food security or food self-reliance.

Other Donor Assistance

It has been estimated the Sahel program will receive more than $1 billion annually over the next 10 years (6). The United States plans to provide approximately 10 percent of this amount, or $100 million to $150 million per year. Tables I-6 and I-7 illustrate the level of total donor assistance to the Sahel by recipient and donor.

France is the largest Sahelian donor. Much of its assistance is non-project specific technical assistance with substantial budget support. The French also provide assistance in cash crop production, agro-industries, and road building similar to what the European Economic Community (EEC) provides. World Bank programs are oriented toward transport projects, cash crop production, cereals, and livestock projects often targeted to the small farmer. The World Bank has also integrated other elements of rural development such as training, extension, credit, and so forth.

Since the drought, Saudi Arabia has become the third largest donor to the Sahel. Its program focuses on infrastructure and budget support rather than technical assistance. Other large donors include Kuwait, the OPEC Development Fund, and the Arab Fund for Social and Economic Development whose projects are primarily oriented toward infrastructure support.

The CILSS/Club framework ensures many complementary efforts among various donor programs. Where their capabilities overlap AID interests, AID encourages joint- or multi-donor participation and financing. Given the very low level of Sahelian development and the need to simultaneously address many different constraints, it is important that donors concentrate on and, wherever possible, coordinate those areas where they have comparative advantage.

Table I-6. Commitments to the Sahelian Countries by Donor

(In millions of U.S. dollars)

| RANK | 1975 | | | 1976 | | | 1977 | | | 1978 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $ | % | | $ | % | | $ | % | | $ | % |
| 1 | FRANCE | 178 | 23 | FRANCE | 212 | 19 | FRANCE | 185 | 18 | FRANCE | 232 | 18 |
| 2 | GERMANY | 86 | 11 | EDF | 149 | 13 | EDF | 129 | 13 | EDF | 170 | 14 |
| 3 | IDA/IBRD | 79 | 10 | IDA/IBRD | 134 | 12 | S. ARABIA | 122 | 12 | CANADA | 116 | 9 |
| 4 | USAID | 71 | 9 | S. ARABIA | 130 | 11 | GERMANY | 96 | 9 | IDA/IBRD | 103 | 8 |
| 5 | EDF | 62 | 8 | GERMANY | 96 | 9 | USAID | 85 | 8 | GERMANY | 95 | 8 |
| 6 | CANADA | 57 | 7 | USAID | 60 | 5 | CANADA | 83 | 8 | USAID* | 87 | 7 |
| 7 | S. ARABIA | 31 | 4 | ADF | 46 | 4 | IDA/IBRD | 64 | 6 | ADF/ADB | 73 | 6 |
| 8 | KUWAIT | 29 4 | 4 | AFESD | 42 | 4 | UNDP | 63 | 6 | NETHERLANDS | 64 | 5 |
| 9 | ADF | 26 | 3 | CANADA | 40 | 4 | NETHERLANDS | 42 | 4 | S. ARABIA | 52 | 4 |
| 10 | BELGIUM | 15 | 2 | NETHERLANDS | 38 | 3 | OPEC SP. FUND | 26 | 2 | UNDP/OTHER UN | 51 | 4 |
| | | 634 | 83 | | 947 | 86 | | 895 | 85 | | 1,043 | 83 |
| | OTHER DONORS | 129.3 | 17 | OTHER DONORS | 159.8 | 14 | OTHER DONORS | 154.9 | 15 | OTHER DONORS | 214 | 17 |
| | | 763.3 | 100% | | 1,106.8 | 100% | | 1,049.9 | 100% | | 1,257 | 100% |

* U.S. contributions to the Sahel in 1978 are based on the amount of funds appropriated to AID for the Sahel Development Program by the Foreign Assistance Act of FY 1978.

Table I-7. Commitments to the Sahelian Countries by Recipient*

(In millions of U.S. dollars)

| | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|
| CAPE VERDE | 20.8 | 25.6 | 40.3 | 51.0 |
| CHAD | 70.6 | 116.2 | 96.5 | 170.7 |
| GAMBIA | 12.9 | 32.5 | 39.6 | 35.5 |
| MALI | 159.8 | 215.9 | 191.6 | 178.3 |
| MAURITANIA | 83.0 | 231.5 | 129.3 | 128.9 |
| NIGER | 106.9 | 189.7 | 128.1 | 176.8 |
| SENEGAL | 144.0 | 131.9 | 165.9 | 224.5 |
| UPPER VOLTA | 110.9 | 121.8 | 178.1 | 197.4 |
| REGIONAL | 54.4 | 41.7 | 80.5 | 93.9 |
| TOTAL | 763.3 | 1,106.8 | 1,049.9 | 1,257.0 |

*Includes Official Development Assistance (ODA) from DAC countries, multilateral sources, OPEC sources, and U.N. Agencies.

## DISASTER PREPAREDNESS AND DEVELOPMENT

How does a disaster preparedness strategy coordinate with the Sahel regional development strategy, and more importantly, AID's special regional assistance program?

It is not difficult to draw parallels between AID's Sahelian assistance program and a disaster preparedness strategy, since one of AID's broad assistance goals is to make the region less vulnerable to drought. Many projects address problems such as data collection, infrastructure, and the lack of trained manpower which weaken the region's disaster-coping ability. Just as food self-sufficiency is one of the strong tenants of the Sahelian development program, self-sufficiency to cope with potential disasters such as periodic drought, food shortages, health crises, and other environmental hazards should be the cornerstone of a regional preparedness strategy.

The major findings of this study include potential opportunities to:

- Introduce a self-contained preparedness component fully integrated into project design;
- Enhance an AID development project's preparedness potential by integrating a preparedness focus into planned project activities; and
- Complement planned or ongoing projects by introducing a separate disaster preparedness activity or a set of activities apart from the AID development program.

Preparedness may be introduced at an early stage in project design, and a proposed schedule for undertaking this activity is found in the following chapters for each AID project. This is probably the most effective way to take advantage of a large-scale development effort. However, an ongoing project with strong potential for preparedness activity may also be used as a vehicle for focusing more strongly on the preparedness aspect. This can be done by integrating a preparedness activity into a planned project activity. A third way preparedness can complement AID development assistance to the Sahel is to introduce a distinctly separate activity not integrated into a project but paralleling project objectives.

## NOTES TO CHAPTER ONE

1 Barbara J. Brown, Disaster Preparedness and the United Nations: Advance Planning of Disaster Relief, New York: Pergamon Policy Studies, 1979.

2 Chad is not included in this review.

3 ONCAD has been abolished largely because of mismanagement, and the other cereals offices have serious problems.

4 Brown, op cit.

5 AID, Sahel Regional Country Development Strategy Statement FY83, February 1981.

6 Ibid, p. 77.

# CHAPTER TWO

## CAPE VERDE

The Cape Verde Islands include 10 islands and five islets in the Atlantic Ocean 600 km west of Senegal. They became independent from Portugal in 1975. Of volcanic origin, the archipelago has one island (Fogo) with an active volcano last erupting in 1951. The mountainous, barren islands have 4000 sq km of land area, only 46,000 acres of which are currently arable.

Located at the western edge of the large arid and semi-arid belt crossing Africa, Cape Verde, like other Sahelian countries, has an arid climate. Rainfall ranges from 1000 mm at the highest elevations to 300 mm or less on the low coastal plains. Rainfall variability is relatively high everywhere, ranging from 35 to 60 percent. The islands have no permanent streams or lakes.

Strong winds and high humidity constantly affect all of Cape Verde. The islands of Santiago, Santo Antao, Fogo, Sao Nicolau, and Brava all have elevations exceeding 300 m, enough to generate orographic rainfall and provide irrigation water for agriculture. The remaining five islands are too dry and flat to sustain more than minimal agriculture.

Between 75 and 85 percent of the total 300,000 population lives in rural areas on the nine inhabited islands. Most subsist on cultivating maize, sugar cane, bananas, coffee, beans, and manioc. Another more primary food source is fishing, an industry comprised largely of small-scale artisan fishermen. The relatively large population in such a small area makes Cape Verde the most densely populated Sahelian country. It also creates a food demand that local agricultural production cannot meet--even with foreseeable technical production improvements.

## DISASTERS IN CAPE VERDE

Cape Verdeans are currently forced to rely on international aid to avoid famine. The drought has reduced agricultural ouput to about 20 to 25 percent of its normal level and made the economy totally dependent on imported food for subsistance for the past 13 years. Prior to recent international support, severe recurrent droughts caused disastrous famines and reduced the population up to 40 percent at a time[1]. Every year flash floods destroy crops, litter fields with rocks and destroy irrigation infrastructure. There are few catchments to store surface water for agricultural use, and little flood frequency or intensity data.

However, drought is by far Cape Verde's overriding concern, and other potential hazards such as volcanic eruption, floods and fire are, relative to drought, less significant.

## Drought and Food Production

Cape Verde has suffered periodic drought cycles for the past 200 years, killing over 200,000 people during that time period[2]. The 1928-42 drought was the longest sustained drought period prior to the currently ongoing 13-year drought (Figure II-1). The present drought began in 1968 but has had two normal rainfall years in 1975 and 1978. The periodically shifting West African Inter-Tropical Convergence (where the South Atlantic monsoon winds and the northeast tradewinds meet) cause these droughts as well as the variable annual rainfall. Cape Verde is too far north to take advantage of the convergence, and small fluctuations in its position have profound effects on the islands. In the past, Cape Verdeans have tended to intensify agriculture and livestock production and increase the population size when rainfall was good, only to suffer greater losses when drought returned.

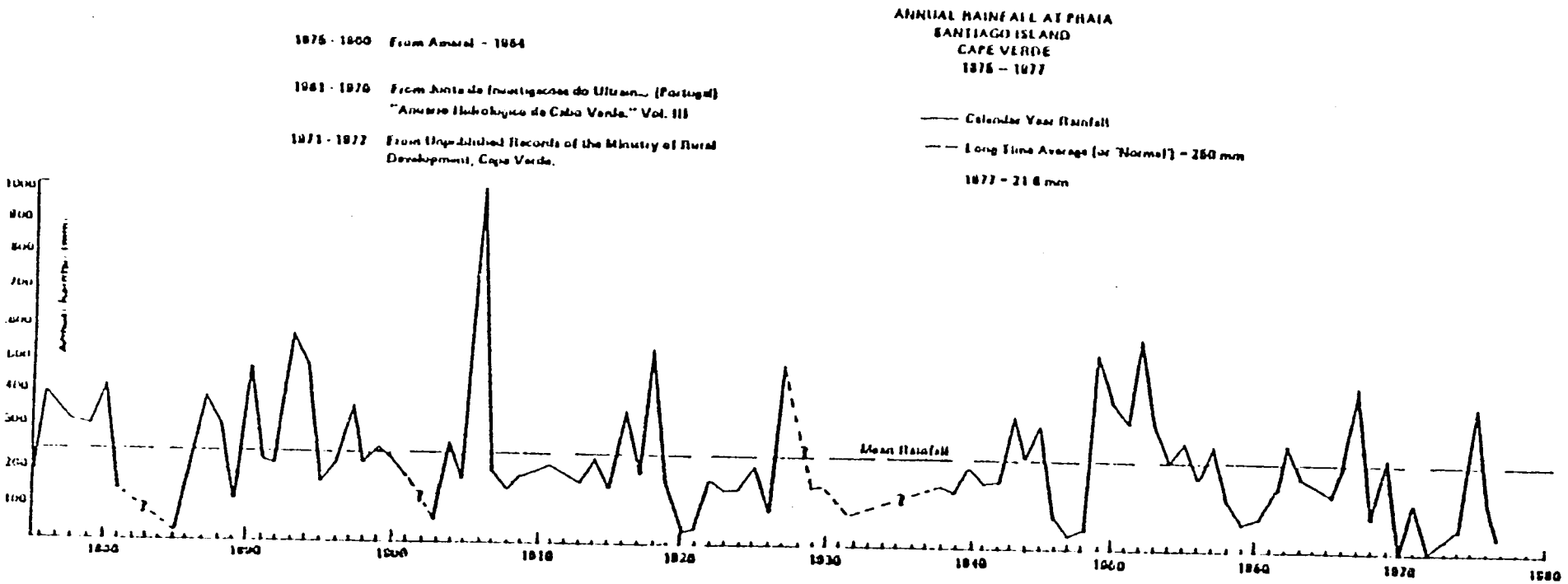
Cape Verde looks primarily toward Portugal and various West African countries for its trade and assistance. This dependence has contributed to a severe balance of payments problem since Cape Verde has virtually nothing to export. Several donor nations have enabled the economy, as well as the people, to survive.

In the past, Cape Verde exported cotton, castor beans, bananas, coffee, and even had a small wine industry. Changing markets, drought and competitive disadvantage have caused agricultural production to be dominated by subsistance crops, largely corn and beans, for local consumption. The islands' agricultural potential is severely constrained by climate as well as poor soils and erosion. Agricultural methods consist of simple manual planting and harvesting methods. Improved crop varieties are not in general use, but ancient varieties, while having low yields, have developed resistance to drought, diseases, and insects. Nor are fertilizer and pesticides widely used.

Irrigated crops consist mostly of sugar cane, cassava, and bananas grown in canyons and valleys where springs, shallow wells or fog condensation provide water. Crops growing along canyon washes are subject to flash flood damage.

The goat is the principal livestock animal due to its ability to subsist on steep terrain and poor quality forage. Ten to 20 years ago, pastures and range lands, though small in total area (541 sq km), were in fair condition. Now, after years of drought, they are parched, degraded, and devoid of vegetation. No true pasture exists in the islands today[3]. Another overgrazing result is the predominance of thorny, toxic, and distasteful plants in areas once used for range. International aid currently provides feed as part of an emergency cattle feeding program.

Figure II-1. Annual Rainfall Records for Praia, Santiago (elevation 27 M.)




Source: Freeman et al. 1978.

Centuries of intense exploitation for fuel, construction, grazing, and agriculture have deteriorated the islands' original natural forests and grasses. The history of recurrent famine and the islands' present barren state presents a monumental development challenge.

## Flash Floods

The topography, geology, climate, and scarce Cape Verdean vegetation all encourage rapid surface runoff. Rains tend to come in torrential storms, and the thin poor soils cannot soak up or retain the water, thereby worsening already steep watersheds. Floods cause some crop damage, especially in canyons. Peak flood flow rates range from 2 to 5 cu m/sec/sq km and last for several hours, subsiding to 60 percent of flow within two to 10 days. Almost 50 percent of rainfall is lost in surface runoff[4].

Flood water control is difficult due to the steep terrain, large amounts of water-borne debris, and the nature of the flood wave. Flood waves of nearly vertical fronts carry large amounts of sediment, and an estimated 7 to 8 meters of coarse deposits have been laid down in successive floods over a 20-year period[5]. Steep terrain makes dam sites scarce since reservoirs are subject to filling from sediment and debris.

## Health Conditions

Malnutrition and poor sanitation contribute to a wide range of Cape Verdean health problems including pellagra, anemia, marasmus, and kwashiorkor. Outbreaks of cholera were reported in 1974 on several islands, and malaria became a severe problem on Sao Tiago in 1972 and again in 1978. Infant mortality is a high 10 percent and has not significantly improved in the past 20 years. Leprosy is also common on Fogo, Santo Antao, Brava, Sao Tiago, and Sao Vincente. Isolation and lack of medical attention are blamed for the disease's persistence.

OFDA's country profile indicates a significant number of deaths result from serious burns and accidents caused by the ignition of low, thatched kitchen roofs or falls on rocky terrain[6].

The most common diseases are pneumonia, tuberculosis, and gastro-intestinal diseases. Although there are only two hospitals, the doctor/patient ratio compares favorably with other developing countries at about 1:7000. The number of other facilities is adequate, although understaffed, poorly equiped, and short of basic supplies.

# DISASTER PREPAREDNESS IN CAPE VERDE

Cape Verde has no national disaster preparedness plan and external emergency assistance is coordinated from the Prime Minister's office. Communication and transportation between the islands is generally good but there are problems of an island-specific nature in this area. The government, apart from its persistent dependence on annual subsistence food aid, is beginning to try to turn the economy around. However, the present emergency agricultural measures have not allowed much institutional capacity to develop particularly with regard to agriculture.

The Government of Cape Verde (GOCV) has little planning capability. Skilled administrative personnel devote most of their time to immediate drought-caused problems. They are concerned with short-term crisis management to avert famine, create jobs, and manage soil and public works projects. Given the demands placed on the relatively small administrative cadre, more government effort goes into preparing reports for donors than self-initiated planning.

An emergency plan has been in effect since October 1977 that describes GOCV public works programs. A National Economic Development Plan is to be completed at the end of 1981. Working groups have been formed to discuss various topics but there are no preliminary documents available. It appears the need for preparedness is great, particularly since drought and the accompanying food shortages will probably be a reality for Cape Verde for years to come until major changes can be made in the way the economy is structured.

While Cape Verde has few natural resources, it does have a few advantages. First, it is favorably located at the intersection of major air and sea routes and in the center of a rich fishing area. Second, Cape Verde's human resources are comparatively well developed. While many leave the islands each year, Cape Verdeans are generally regarded as intelligent, industrious, and have traditionally filled middle-level positions between colonizers and the indigenous populations in Guinea-Bissau and other West African states. Large numbers of Cape Verdeans have also learned valuable skills as workers in Africa, Europe, and, in some cases, the United States. In terms of human resource development, Cape Verde is probably more advanced than other African countries at similar levels of development.

## AID ASSISTANCE STRATEGY IN CAPE VERDE

Given the lack of a government development plan, AID has proceeded with its Cape Verde program under the following assumptions:

- The highest priority will be resolving the food deficit problem;
- Due to continued drought, policy issues concerning food storage and high unemployment rates are also major problems to be addressed;
- Significant increases in food production are possible, but Cape Verde is unlikely to become self-sufficient in agriculture; and
- The government's absorptive capacity is severely strained and its ability to fund additional recurring costs or provide local technicians limited.

Since independence six years ago, the government has taken several positive steps toward rural sector development. These include:

- Major land reform in 1976-77 to abolish sharecropping with additional initiatives to be taken;
- Supporting farmer cooperatives;
- Pursuing many rural works activities with donor assistance to generate employment, check soil erosion, improve water supply, and so on;
- Constructing rural area primary schools and health posts; and
- Initiating population and nutrition programs[7].

AID will continue agricultural sector assistance to repeat successful AID-funded soil conservation and water resource development projects as well as support activities to expand irrigated lands. Groundwater is now the only source of both irrigation and domestic water. It is obtained from shallow hand-dug wells and natural springs. Drilled wells were not constructed until 1970 and are not deep. Approximately two-thirds of recoverable groundwater is lost to the sea.

In FY83 AID plans to explore the feasibility of moving into the agricultural sector to help the country increase its food production, stabilize the deteriorating natural resource base and improve rural population and nutritional levels. The phased

development of the Tarrafal area through the AID-financed Tarrafal Water Resources Project will significantly increase the country's irrigated area and provide economic opportunities for an economically depressed region. The Watershed Management Project will provide rural area employment, increase the amount of arable land in river beds, increase water supplies, plant thousands of trees, and develop land use plans for four contiguous watersheds that will serve as a future planning effort model. AID is also supporting the renovation of a desalination plant in the Potable Water Supply Project and is promoting rural area employement through the Rural Works Project ending this year. AID has obligated $3.5 million for Cape Verde in FY82 and the FY83 AAPL is $3.8 million (excluding P.L. 480 and Title II programs)[8].

Fishing plays an important role in Cape Verde's economy and shows much potential for increased food production. While not directly affected by drought, this industry's importance bears mention. As of 1971 (the latest available figures), fish and fish product exports accounted for nearly 40 percent of Cape Verde's $3 million total exports. Bananas accounted for 18 percent and salt for 8 percent[9]. Waters around the islands are rich in fish, but they are currently exploited mainly by Japanese ships fishing for tuna and French ships for lobster. Fuller Cape Verdean use of its fisheries resources requires modernizing the fishing fleet, further expanding and improving processing facilities, and training Cape Verdean fishermen in the use of modern equipment and techniques. AID plans to get involved in the fisheries resource sector in FY83.

The following section discusses ongoing and proposed AID-supported projects in Cape Verde in more detail, and reviews their suitability for emergency preparedness activities.

## PROJECT ANALYSIS

The following analysis identifies potential opportunities for increasing emergency preparedness in Cape Verde through donor-financed development projects. Information sources for this section include the Cape Verde CDSS FY83 Small Program Statement, draft environmental report on Cape Verde, ORDA country profile and project papers, and UNICEF and UNDP country program profiles.

### AID-Supported Projects

Table II-1 presents a listing of selected ongoing and proposed AID-supported Cape Verdean projects. Because of the small size of AID's Cape Verdean program ($3.5 million in FY82), all current projects have been reviewed for their relevance to emergency preparedness. Only those projects continuing through FY82 and beyond have been reviewed.

Table II-1. Selected Ongoing and Proposed AID-Supported Projects in Cape Verde

| Project Name and Number 655-- | Description | FY of Initial Funding | Project Comp Yr. | Project Cost FY82 OBL | Project Cost FY83 AAPL | Project Cost Total LOP Auth. |
|---|---|---|---|---|---|---|
| Tarrafal Water Resources 003 | To provide GOCV with equipment, technical assistance and training required for carrying out investigations and training on a proposed 600 ha irrigated land expansion in Tarrafal region. | 77 | 82 | -- | -- | 3000 |
| Potable Water Supply & Power 004 | To renovate an existing desalination plant, and introduce sound management and technical operating practices and proper financial procedures. | 77 | 82 | -- | -- | 127 |
| Primary and Non-Formal Education 0008 | To improve primary and vocational education facilities on the islands of Sao Tiago, Fogo and Brava and upgrade the professional skills of teachers and administrators responsible for elementary education programs. | 78 | 81 | -- | -- | 3000 |
| Tarrafal Water Resources Phase II 0010 | To develop surface groundwater resources to irrigation 400-600 ha in the Tarrafal region and help the GOCV develop newly irrigated land into productive farm units. | 82 | 85 | 597 | 2300 | 5000[a] |
| Food Crop Research & Extension 0011 | To increase selected irrigated crop yields and strengthen the GOCV's capacity to carry out an applied agricultural research program. | 82 | 84 | 1142 | -- | 1142 |

Table II-1. Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| Integrated Fishery Development and Production 0012 | To alleviate the food shortage, increase the ideal population's protein supply, create total area employment; and increase the country's foreign exchange earnings by exporting fish after meeting domestic needs. | 83 | 86 | -- | 1500 | 6500[a] |
| Watershed Management 0006 | To help the GOCV use labor intensive techniques on watershed management problems in four contigous Sao Tiago valleys. | 79 | 82 | 1761 | -- | 6275 |
| Rural Works 0001 | To provide employment opportunities for a large percentage of Cape Verdean workers by applying labor intensive techniques in soil and water conservation works and farm-to-market roads in Sao Tiago. | 75 | 81 | -- | -- | 4430 |

[a] Planned obligation

Source: Annual Budget Submission FY 83, Cape Verde, June 1981; FY82 Congressional Presentation and interviews with AFR/DR desk officer, Cape Verde.u

## Ongoing Projects

Current FY82 Cape Verdean projects include largely activities that are ending within the next few months. The Rural Works Project was authorized in 1975 and will end in September 1981. It was designed to provide employment opportunities for Cape Verdean workers by applying labor intensive techniques in soil and water conservation works and farm-to-market roads.

AID has also financed the renovation and construction of desalination and power plants at Sal and Mindelo to create additional potable water supplies. Both projects will end shortly.

Finally, the Watershed Management Project, which terminates in FY82, supports labor-intensive soil and water conservation projects. AID has provided technical assistance, pilot extension service training, equipment and commodities, labor costs for building soil and water conservation structures, and training facility construction.

## Proposed Projects

There are three proposed projects due to start in FY82 and FY83. Two support the agriculture sector and one involves developing fisheries resources.

In its present form, the Tarrafal Water Resource Project does not present obvious emergency preparedness opportunities since it will be terminated shortly. However, a second phase is planned and this project's design will take place in FY82.

Phase II of the Tarrafal project will involve carrying out an integrated irrigation scheme based on Phase I investigations. The scheme's success depends on reliable data concerning groundwater and surface water storage, currently being developed, and the GOCV's ability to establish an adequate administrative structure for managing crop production and marketing. The effort will include drilling and equipping production wells and galleries; possibly constructing a medium-size dam to create a storage reservoir; land preparation; organizing management, production and marketing units; and continuing work in soil conservation and upper watershed reforestation. The newly irrigated area will be used for producing tubers, vegetables, fruits, and peanuts, primarily for domestic consumption. Part of the Phase II project will help provide secure water supplies to area villages and towns. AID's major inputs will be irrigation systems equipment; technical assistance in civil and irrigation engineering, agronomy, agricultural economics, farm management and marketing; and local construction financing.

While it is too early to predict exactly how preparedness intervention might be realized, one obvious area to investigate concerns establishing crop production and marketing units to help cover food deficits and crop yield forecasting. Another possibility concerns establishing an emergency plan managing water resources.

The Food Crop Research and Extension Project will start in FY83. It consists of a coordinated attack on crop production constraints by improving crop and production research; helping to strengthen and coordinate national agricultural research management; and developing a functional relationship between research and extension programs. AID's inputs will include long- and short-term technical assistance; and short-term training at international or regional institutions. It is too early to determine where preparedness intervention might be appropriate.

The Integrated Fishery Development Production Project, which will start in FY83, will help the Society for the Commercialization and Assistance for Artisanal Fishery, General Directorate of Fishery, address the needs of artisan fishermen located primarily in rural Santiago areas and possibly Sao Vincente. Help would be provided to design and construct more suitable boats, a breakwater, ramp, and other beaching facilities. Data collection for artisanal fish stock assessment will also be carried out under this project, and processing, marketing and instruction will be explored for possible inclusion as well. Technical assistance and participant training will be provided to strengthen the country's manpower capacity in constructing boat and beaching facilities, improve fishing skills and techniques, and increase bait supplies. The GOCV has strongly emphasized increased fishery resource development as a preparedness measure since the country will probably not become self-sufficient in agricultural products and needs alternative food sources to lessen its dependence on external aid.

Table II-2 presents the proposed design schedule for these projects.

## P.L. 480 Title II Program

AID's food assistance program for FY78-81 has been carried out under P.L. 480 Title II emergency provisions. Under this program, the GOCV sold most commodities and used the proceeds for soil and water conservation and road construction public works projects. While this food aid has helped meet Cape Verde's emergency needs and financed constructive rural development activities, the lack of a multi-year agreement has prevented the long-range planning needed for dealing with the country's permanent food deficit situation. Therefore, USAID/Praia has submitted a proposal to replace emergency food assistance with a multi-year Food for Development Program under Title III.

Table II-2. FY82 Proposed Project Design Schedule for AID Projects in Cape Verde

| Project Title and Number 655-- | PID Completion DATE | Project Paper Completion Date |
|---|---|---|
| Tarrafal Water Resources Phase II 0010 | March 1982 | August 1982 |
| Food Crop Research Fund Extension 0011 | December 1981 | June 1982 |
| Integrated Fishery Development and Production 0012 | June 1982 | FY83 |

[a] Source: Interviews with AFRDR desk officer, Cape Verde.

The proposed Title III program means AID would supply approximately 15,000 tons of corn annually for a three-year period starting in FY82. Local currency proceeds from the commodities' sale will be used to expand soil conservation and water resource development and reforestation projects on Sao Tiago Island. These projects would be integrated efforts to control desertification by constructing terraces, dikes, and small catchment dams; revegetation, including reforestation and pasturage; and improving water distribution for irrigation and household use. GOCV and USAID/Praia have had considerable success in implementing these labor-intensive projects, which both provide necessary rural area employment and further GOCV's development objectives.

Another activity being considered under the Title III program would involve a fisheries project. It would consist of equipment to modernize the artisanal fishing fleet and fish handling facilities to increase the catch's domestic marketing.

A third type of intervention being proposed would involve suppporting a policy study and intervention in several key sectors of the Cape Verden economy, such as land use and tenancy, and price policy.

## Other Donor-Assisted Activities

Many nations and international organizations are helping Cape Verde in all its economic sectors. Technical assistance to the Ministry of Rural Development (MRD) in agricultural planning and program development is provided principally by UNDP experts in soil and water conservation, reforestation, and groundwater exploration. Bilateral assistance has been project-oriented. Each country has concentrated on one or two specific islands, with AID concentrating on Sao Tiago. This MRD-favored approach seems to be administratively efficient and avoids competition and overlapping bilateral programs. Several countries are providing support for the agricultural experiment station on Sao Jorge, including the Federal Republic of Germany (biology and phytosanitary work/equipment); France (nematology laboratory); Netherlands (soil and water laboratory building); and FAO and Brazil (equipment for the soil and water laboratory).

The French conducted a groundwater survey throughout Cape Verde in 1974 and have been involved in a well-drilling program on Sao Nicolau since 1976. They are also providing equipment for increasing Sao Nicolau fish exports, including equipment for canning factories, boat motors, lobster holding tanks, and some training.

Germany supplied $7 million in aid to Cape Verde in 1978, over 40 percent for technical assistance on Sao Tiago. Proceeds from German food aid provide local currency for German-supported Fogo irrigation projects ($5 million); integrated rural development projects on Maio and Fogo; and Sao Jorge experiment station

equipment. Studies are underway to develop an integrated agricultural and fisheries program on Fogo, and a second demonstration irrigation project is being planned for Praia Ladrao to be supplied by a sea-level spring[10].

Belgium is funding $3.9 million of a $6.5 million reforestation project for Sao Tiago and Maio which will terminate in FY83. It is being administrered by an FAO forester assigned to the MRD, and includes training and research, surveys, and management plans as well as reforestation.

The Netherlands is funding a $7.2 million program (1978-89) mostly concentrated in the Santo Antao fisheries sector. Port facilities in Mindelo are being upgraded and the Netherlands is providing $3.4 million to expand freezer capacity there.

The People's Republic of China has provided $500,000 for agricultural development and irrigation. Other bilateral donors include the Swiss (horticulture), the Portuguese (scholarships), the Soviet Union and Cuba (health sector), Brazil, Abu Dhabi, and Saudi Arabia.

UNDP/FAO and UNICEF are the primary United Nations organizations involved in Cape Verdean development programs. The World Bank has not yet developed a lending program for the country. From April 1977 through March 1981, UNDRO has undertaken no relief or preparedness activities in Cape Verde. The following discussion reviews UNICEF and UNDP programs in more detail.

## UNICEF

UNICEF has provided nearly $2.4 million in assistance to Cape Verde from 1980-83 (Table II-3). Its program is largely directed towards the following objectives: promoting a social and health policy that meet the essential needs of vulnerable age groups with maximum community participation; adapting primary education to national development requirements; providing drinking water for the rural population; and developing groundwater resources.

UNICEF is continuing to support vaccination campaigns and further action in nutritional rehabilitation. It will supply equipment for cold-storage facilities, the logistical means for the immunization program, basic equipment for health workers and midwives, and rural medical post equipment.

Social service sector objectives include ensuring the operation of the Social Development Workers' Training Center; strengthening the rural community development program and women's advancement; instituting a health education and environmental hygiene program based mainly on social centers; and establishing a nutritional training and supervision program through appropriate medical post action.

Table II-3. Project UNICEF Program of Cooperation 1980-83

| Commitments | 1980 | Probable amount of annual call-forwards 1981 ($US 000) | 1982 | 1983 | Total |
|---|---|---|---|---|---|
| Balance, at January 1, 1980 of commitments covering future call-forwards. | 130 | 126 | -- | -- | 256 |
| Future Commitments (forecasts)[a]. | - | - | 150 | 180 | 330 |
| Total Commitments | 130 | 126 | 150 | 180 | 586 |
| Notings | | | | | |
| Notings for which additional funds are required January 1, 1980. | 460 | 40 | - | - | 500 |
| Future Forecast, notings to be prepared. | -- | 340 | 460 | 550 | 1350 |
| Total Notings | 460 | 380 | 460 | 550 | 1850 |
| Total Commitments and Notings (actual and projects) | 590 | 506 | 610 | 730 | 2436 |

[a] A recommendation to provide financing from general resources will be submitted to the Executive Board at its 1982 session; the period to be covered will follow that of the First National Development Plan.

Source: UNICEF Country Programme Profile, Cape Verde, February 29, 1980, E/ICEF/F/L. 197.

UNICEF's education efforts will aim at extending the school canteens program, strengthening teacher supervision in primary schools; preparing textbooks and teaching materials for school teachers; and expanding scientific and pre-vocational teaching at the primary school level.

UNICEF also financed a rural area water project which involved developing 30 new water points by drilling boreholes serving approximately 23,100 inhabitants. In addition, engineering works to raise the valley bottom water table levels are in progress and will continue through FY82.

UNDP

The UNDP's 1977-81 Indicitive Planning Figure (IPF) for Cape Verde was $3.04 million.

The UNDP program concentrates on the following sectors:

- Ground water exploration (about 26 percent);
- Developing fishery resources (about 24 percent);
- Developing transport and communications (civil aviation--about 25 percent);
- Soil protection, conservation and crop protection (about 20 percent); and
- Miscellaneous themes (about .2 percent).

The first and fourth assistance areas are an integral part of the campaign to offset Sahelian drought affects whereas the second and third themes relate to more Cape Verdean-specific problems (although these are also common to several Sahelian countries). Table III-4 illustrates the nature and level of the UNDP Cape Verdean assistance program. Regional project descriptions can be found in chapter nine. Of these projects, the Central Planning Project which helps the MRD prepare a national plan for soil and water conservation, and reforestation and crop protection offers the most potential for complementary preparedness activities.

Efforts could be made to insure that the information generated in formulating these soil, water, forestry, and crop protection strategies are incorporated into a National Emergency Preparedness Plan.

Project descriptions for the 1982-86 funding cycle have not yet been approved by the Governing Counsel and are not available for review. Most of the projects listed in Table II-4 are scheduled to be continued into the next funding cycle.

Table II-4. Selected UNDP-Assisted Projects in Cape Verde

| Project Name and Number CVI | Description | Period of Execution | Executing Agency | Total UNDP Contribution ($US 000) |
|---|---|---|---|---|
| Groundwater Project | To exploit groundwater to satisfy urgent potable water needs. | 1979-82 | Technical Cooperation for Development (UN) | $678,000 |
| Fisheries Project | To ensure self-sufficiency in fish consumption; absorb the unemployment created by the prolonged drought; and promote women's integration into the country's economic development. | 1977-81 | FAO | $769,300 |
| Civil Aviation Project | To strenthen travel between islands by expanding air lanes and airline capacities. | n.a. (ongoing) | International Civil Aviation Organization | $700,000 |
| Assistance to the Ministry of Rural Development | To promote soil and water conservation, protect vegetation, and foster extension services. | 1977-82 | FAO | $750,000 |

Sources: UNDP area officer, internal UNDP documents.

## CONCLUSION

The size of external donor financing in Cape Verde is comparatively small as is its geographic area. Cape Verde is relatively well off in terms of human resource development and possesses a fairly well-educated, skilled cadre of high-level managers. However, Cape Verde, as distinct from the other Sahelian countries, is in a perpetual state of disaster and will probably never become grain self-sufficient. There are a few possibilities for emergency preparedness activities which appear in the AID, UNDP, and UNICEF country progress reports. These possibilities are to:

- Investigate the possibility of incorporating crop yield forecasting models for use in the GOCV's crop production and marketing units in the context of the Tarrafal Water Resource Project, Phase II. The PID is scheduled for March 1982.

- Investigate the possibility of incorporating emergency management into the December 1981 design of the Food Crop Research and Extension Project.

- Investigate the possibility of using Title III Food for Development proceeds to finance preparedness planning activities in conjunction with planned desertification, soil conservation, and water resources development projects. Title III funds will also be used to support a policy study regarding intervention in key Cape Verdean economic sectors. A study of preparedness needs might also be appropriate in this regard.

- Investigate the possibility of working within the MDR to help design a national emergency Preparedness plan in conjunction with UNDP's Central Planning Project.

# NOTES TO CHAPTER TWO

1 Arid Lands Information Center, Draft Environmental Report on Cape Verde, August 1980, p. 7.

2 AID, Cape Verde Food for Development Proposal, February 1980, Annex III, p. 14.

3 Draft Environmental Report, op cit, p. 12.

4 Ibid, p. 16.

5 Ibid, p. 18.

6 OFDA, Country Profile Cape Verde, February 1979.

7 AID, Small Program Strategy FY83 Statement, Cape Verde, February 1981.

8 FY82 Congressional Presentation, Cape Verde.

9 AID, Cape Verde Rural Works Project Paper, December 1980, Annex C, p. 5.

10 FY82 Congressional Presentation, Cape Verde.

11 UNDP, Country Programme for Cape Verde, September 1977, DP/GC/CVI/R.1.

# CHAPTER THREE

## THE GAMBIA

The Gambia is one of Africa's smallest countries, only 320 km long and 24 to 48 km. wide. Senegal surrounds it on three sides. The country's dominant feature is the Gambia River which it encases for 470 km as the river meanders toward its Atlantic Ocean exit. Discussions of disaster hazards and economic development focus on problems caused by potential river exploitation and erratic rainfall.

The country's terrain is flat with broad shallow plains rarely higher than 50 m in elevation. Population settlement tends to avoid the low riverside land around mangrove swamps bordering the river due to problems with saltwater flooding and insect pests. Conditions are only favorable for riverside habitation far upstream since the dry season reduces freshwater flows down the river, permitting tidal saltwater to intrude 250 km upstream.

The Gambia has an estimated 602,000 people with a population density ranging from 261 per sq km to 41 per sq km. Most of the population--85 percent--lives in rural areas, but there is significant migration to urban areas. Agriculture is the country's most important economic activity. It accounts for over 60 percent of the gross domestic product (GDP), provides a livelihood for more than four-fifths of the population, contributes more than 95 percent of the export earnings, and forms the basis for the principal processing industries. The Government of the Gambia (GOTG) recognizes that its heavy dependence on agriculture makes it vulnerable to environmental hazards such as drought, devegetation, overgrazing, and declining soil fertility. It is these hazards and the development programs undertaken to address this vulnerability which are important to understand in the preparedness context.

## DISASTER IN THE GAMBIA

The Gambia has a Sudano-Sahelian climate with annual rainfall ranging from 1400 mm in the southwest to 900 mm in the north. Partial crops failures occur one year in five due to rainfall variability and erratic distribution. The 1970-77 drought was the most severe and prolonged in recorded history, and a 1979 drought spell caused considerable agricultural losses.

Drought is Gambia's most serious disaster hazard. Total U.S. drought assistance to the country from 1968-81 totaled over $600,000.

The Gambia also suffers periodic yellow fever outbreaks. Yellow fever is epidemic in the country, and the rainy season produces ideal breeding grounds for the mosquitos transmitting the disease. (Over 120 yellow fever strains have been identified.) The most vulnerable population is children under six months of age and other non-immunized persons. In 1978 there was a countrywide yellow fever outbreak killing more than 200. U.S. emergency assistance totaled $50,000.

That year, Gambia also suffered a power shortage in Banjul which affected 85,000 people and produced an estimated $4 million in damage. Since then, the generators have been repaired or replaced, but there is little information available on whether contingency plans have been made to deal with such a situation should it recur. This is one area for disaster preparedness, and further investigation is needed to determine the extent and nature of the need.

Since drought and disease are the two most important disaster hazards now affecting human life, the following discussion will focus on the problems affecting food production and health care in the Gambia.

## Food Production

Rainfall is the principal constraint restricting increased Gambian agricultural production. Erratic and uncertain rainfall produces low crop returns when compared to production factors, and encourages agricultural labor's drift into more financially rewarding or socially attractive occupations.

It is impossible to overstate agriculture's importance in terms of economic significance and local population preoccupation. Agriculture is the Gambian economy's backbone and main source, directly or indirectly, of most individual regional income. About 85 percent of the population earns its livelihood from crop farming, animal husbandry, fishing or related rural activities which together produce two-thirds of the region's GDP.

Gambian agriculture is largely rainfed crop husbandry and traditional livestock raising. Irrigated agriculture is practiced only on small areas. An estimated 400,000 acres of land is under annual cultivation with additional landholding in fallow, woodland, and permanent grazing areas. Rice, millet, and sorghum are traditional food crops, mostly consumed on the farm. Maize is a minor crop, but very important in certain upriver areas and among certain tribal groups. Groundnuts are the most important cash crop and the Gambia has become heavily economically dependent on them. The current Five-Year Development Plan stresses intensified rural sector development and increased agricultural production diversification with better rural resource management.

If the Gambian agricultural system is to develop, several underlying problems must be addressed. These include:

- Problems related to growing population pressures (human and animal) on a limited land resource base;
- Low traditional crop and livestock enterprise system productivity;
- Lack of adequate rural infrastructure; and
- The rural population's limited exposure to modern agricultural technology.

Most cultivation is done by hand. A government program to introduce oxen technology has been underway since the 1950s. Progress in getting animal traction accepted has been slow due to traditional farmers' natural reluctance and conservatism, inadequate extension services to teach farmers about oxen care and use, and most important, the lack of capital or credit to purchase bulls and implements. However, the oxen have significantly changed Gambian agriculture.

Traditional food crop production is not sufficient to meet domestic consumption. This entails a continued reliance on food imports--chiefly rice--which represents nearly one-third of average annual consumption requirements. Similarly, farm enterprise development involving livestock has been neglected in proportion to its potential economic value for the total farming system.

The lack of mechanized soil cultivation severely limits the soil management methods available to Gambian farmers. Since plant residues or green manure crops cannot easily be plowed into the soil, maintaining adequate organic matter levels is very difficult. Soils cannot be rough tilled to increase water intake or retard erosion. In short, while Gambian soil and water problems are very similar to other Sahalian countries, the range of solutions available is much more limited.

Soils throughout the Gambia are low in plant nutrient levels. An estimated 40 percent of all soils are suitable for agricultural purposes, with another 14 percent suitable with qualifications, and the remaining 46 percent unsuitable or of only marginal utility.

Soil makeup is generally unresponsive to fertilizers, including animal manuring. The nature of Gambian soils and man's vegetative cover manipulations have produced an increasing amount of sheet and gully erosion in various spots throughout the country. Soil erosion, excessive and damaging water flows off the land, and other serious resource damage are occuring at an increasing rate.

These problems pose serious difficulties for the rural population and the GOTC which seeks to prevent environmental damage from overgrazing, indiscriminate devegetation, soil depletion, and general productivity loss. An increasing population has placed additional pressure on the land and water resource base. These pressures result in more acres cleared, more livestock grazing, and more woodcutting. Efforts to extend traditional crop and livestock enterprises by increasing the land surface inexorably lead to greater conflicts among farm enterprises (dry season rice cultivation versus land use for livestock forage reserves, shortening fallow periods and longer continuous planting of soil-depleting crops, using scarce agricultural resources on even more marginal croplands, and excessively removing the forest cover).

Encouraging intensified agricultural production is also difficult due to lack of adequate development resources and proven adaptable technologies.

The situation is particularly bad on land that is not cultivated annually. External donor agencies have tended to concentrate their attention and available resources on existing cropland while neglecting the equally important problem of managing fallowed non-crop land. This situation has produced a non-integrated rural resource management approach.

The long-term outlook indicates the Gambian economy will be highly dependent on its agricultural output for the next several decades. It is therefore critical that care be taken to insure the maintenance, and development of agricultural production and a more efficient utilization of the nation's natural resource base.

While drought has been and continues to be a grave problem for the Gambia, a more serious and underlying issue is land and water resource erosion. If the natural resource base is not preserved, no amount of rainfall will help produce crops. It is for this purpose that AID's Gambian program is directed.

## Health Care

Gambian health and nutrition are generally poor. Infant mortality approaches 50 percent and life expectancy is 35 years. Inadequate nutrition exacerbated by intestinal parasites is the most basic Gambian health problem and contributes directly toward lowered disease resistance. A predominantly vegetarian diet does not ensure adequate growth, and poor health care compounds the problem of infant survival. The most vulnerable population groups are rural women and infants since custom dictates that men and older boys have priority in family food supply distribution.

The rainy or "hungry season" is the peak period for infant mortality and adult morbidity. Food stocks and savings from the previous harvest are usually exhausted at this time while field labor increases in preparation for the next crop. These stresses increase disease susceptibility. Wet conditions also lead to an increase in water-borne diseases, such as gastroenteritis, malaria, schistosomiasis, and onchocerciasis. About 90 percent of Gambians carry malaria. Other diseases include yellow fever, trypanosomiasis, leprosy, tuberculosis, venereal disease, and measles.

National and international programs have attempted to address some of the Gambia's health problems. These have taken the form of urban area sanitation systems and vaccination campaigns. Current national objectives include extending primary health care to rural areas and improving village sanitation. In the past, AID has helped establish national health statistics and disease surveillance programs, emergency food supplies, and family planning services. There are considerable logistical and ecological problems involved in controlling the vectors of water-born diseases, so these problems have not been as easy to attack.

Malaria is seasonal, peaking at the rainy season's end, as does yellow fever. Chemical mosquito control programs pose severe environmental hazards. Therefore, other methods--introducing larvae-eating fish, removing trailing vegetation from mosquito-breeding irrigation ditches, and draining standing water--have been introduced. Schistosomiasis is another Gambian health problem that also becomes more severe during the wet seasons. Improved sanitation is the best control for this disease.

Trypanosomiasis or sleeping sickness becomes most severe at the end of the dry season when tse tse flies are restricted to water holes used for swimming and bathing. The flies breed in moist sand shaded by low bushes. Destroying such vegetation is helping to reduce this disease, but these measures are not sound land management practices and alternative controls must be found.

AID is not presently involved in the Gambian health sector. Any measures taken in the emergency preparedness area to mitigate against environmental hazard effects are taken outside the current AID program. Given budgetary constraints, proposed primary health care intervention planned for FY82 has been delayed. Further discussions will be necessary to determine if and when a health sector investment will be made, and if preparedness action is appropriate within the context of that planned activity.

Armed Insurrection

The most recent Gambian emergency occured on July 30, 1981 when an armed rebellion took place. It was put down in a few days. With the President's return, cabinet activity resumed on August 5. The abortive rebellion caused some dislocation and resulted in shortages, particularly in health services and supplies and food.

The number of deaths is not known but is reckoned to be between 500 and 1000. The most important factor in this emergency situation was the human element--the number of persons killed and wounded, and, to a lesser extent, food shortages. Physical damage was relatively minimal.

## DISASTER PREPAREDNESS IN THE GAMBIA

Very little is known about the Gambia's in-country capacity to respond to emergency situations. During the recent armed insurgency crisis, the government managed to request assistance quickly and established an ad hoc Committee on External Aid to coordinate assistance. The Gambia does have a national disaster plan, but there is very little activity associated with it. Before an adequate assessment of emergency preparedness needs can be made and potential preparedness activities identified, an analysis of the GOTG's capacity to respond to emergencies should be made.

The following discussion of possible preparedness activities is made with very little knowledge of in-country capacities. Therefore, no assumptions are made with regard to existing national plans or institutional preparedness.

## AID ASSISTANCE STRATEGY IN THE GAMBIA

AID strategy in the Gambia is designed to help improve the rural poor's living standards, increase the GOTG's capacity to achieve food self-sufficiency, and reduce single crop dependency. Central to the AID strategy over the next several years is the assumption that an anti-salinity dam will be built across the Gambia River in the mid-1980s. Without the dam, chances of significantly increasing food production through irrigation are slim. This regionally funded project proposes to help the river basin countries (Gambia, Senegal, and Guinea) analyze the environmental and socioeconomic aspects of their river basin development plans and help regional institution building.

The dam's construction will greatly increase the amount of irrigated land within Gambia. However, the whole country will not be affected in this manner, so AID's assistance strategy also concentrates on improving the country's traditional rainfed agricultural practices and better managing the Gambia's agricultural development.

USAID/Banjul is not proposing any new projects for FY83. The current program as reflected in Table III-1 the rural orientation and emphasizes agriculture as outlined in the CDSS. The lead activity in AID's country program is the Mixed Farming Project. Unfortunately, this project is seriously underbudgeted owing to underestimated technical assistance costs as well as the reincorporation of a previously separated socioeconomic study. The proposed additional funding requirement is $3 million, bringing the total project cost to $9 million.

The Soil and Water Management Unit project is the AID program's next priority area because of its potential significance in improving GOTG agriculture infrastructure and subsequent Gambian soil and water resource management. The GOTG has given increased attention to this project, and it is expected that a full-scale Soil and Water Division will soon be created within the Ministry of Agriculture (MOA). Unfortunately, this project also suffers from underbudgeting due to underestimated training requirements and overestimated technical assistance during the project's design stage. The mission is proposing a $1.5 million increase following a February 1981 evaluation.

The future of the P.L. 480 program is uncertain and is presently under GOTG review. For a while it appeared the government wanted to use the program to attack malnutrition by focusing on at-risk children, thus reducing the program's commodity size. It now seems the GOTC may want to significantly expand the program to partially substitute for commercial food imports. The GOTG/CRS proposal has not yet been submitted.

Other important projects included in the AID assistance strategy include a forestry project, a roads maintenance project and support for developing cooperatives in addition to regional projects discussed in chapter nine. The forestry project is now terminating and discussions are being held to determine whether a second phase would be appropriate. The roads maintenance project also ends this fiscal year. Assistance to the PVO cooperatives project is being continued, carried out by the U.S.A. Cooperative League. Another PVO project terminating this year is the Training for Development Project administered by Opportunities Industrialization Center International, Inc. This project supports training former Gambian students in improved agricultural production techniques at a rural-based center originally established with AID funds.

# PROJECT ANALYSIS

The Gambia receives development assistance from several bilateral governmental donors, regional and international organizations, and voluntary agencies. Many of the these donors have been drawn to the Gambia by the Gambia River Basin Development Project--the single most important development effort unfolding over the next several years. This discussion will analyze the preparedness potential of only those national programs supported by AID, the World Bank, UNDP, and UNICEF. A discussion of the river basin development effort, a regionally-funded program that several donors sponsor, can be found in chapter nine.

## AID-Supported Projects

Table III-1 gives a selected listing of Gambia's ongoing and proposed AID-supported projects. Because of recent budgetary constraints and other project-specific problems, there are several proposed projects, such as renewable emergency and primary health care, which are not part of the current AID program. Given the small number of projects in the assistance package, all project papers have been reviewed for their relevance to emergency preparedness.

Documentation sources on these projects include the 1976-80 Development Assistance Program (DAP), FY83 CDSS, and project papers and proposals. Table III-2 summarizes the primary AID inputs to these projects and identifies some potential preparedness activities related to planned project activities.

There is little information at AID about proposed PID or PP activities in connnection with FY83 projects. Of particular interest to emergency preparedness is the proposed Agricultural Development Project. A $7.5 million World Bank-led project is a multi-donor effort aimed at increasing overall agricultural production. Project development, due to be designed in FY82, has been delayed due to unresolved GOTG policy issues potentially affecting AID's project role.

If approved, the Primary Health Care Project may also have potential for an emergency preparedness role. It is still in the PID development stage and, if implemented, is expected to play a major role in the GOTG's high priority Primary Health Care Plan which focuses on rural villages. This will be AID's first bilateral health sector project.

Under it, AID would support approximately 21 percent of the total project costs ($1.2 million) to construct and equip two division health team headquarters, seven dispensaries, and three health centers, as well as 15 rural laboratories at current and

Table III-1. Selected Ongoing and Proposed AID-Supported Projects in Gambia

| Project Name and Number 655-- | Description | FY of Initial Funding | Project Completion Year | FY82 Auth | Project Cost FY83 AAPL | Total LOP Authority |
|---|---|---|---|---|---|---|
| | | | | | ($US 000) | |
| Soil and Water Resources Management Unit 0202 | To establish a Soil and Management Unit within the MANR; develop technology for improved agricultural/ | 79 | 83 | 750 | 750 | 2.0 |
| Mixed Farming and Resource Management 0203 | pastoral methods consistent with Gambian abilities and resources; train Gambian soil and water management specialists and agricultural assistants to solve soil and water problems at national and village levels. | 79 | 83 | 1471 | 1529 | 6.0 |
| Agricultural Development Project 0204 | To increase overall agricultural production. Part of a World Bank-led effort to support traditional farmers, including extenson, input supply and marketing services on a countrywide basis. Establishing national seed multiplication scheme and research into irrigated and upland food crops. Support for livestock marketing and rehabilitating small irrigation schemes. The nature of AID participation has not yet been determined.<br><br>Promote the identification and integration of crop and livestock production within existing Gambian farming systems to increase net rural family incomes on an ecologically sound and sustained yield basis. | 82 | 85 | 1050 | 2021 | 7.5 |
| Rural Roads Maintenance 0206 | To improve the capability of the Public Works Department to manage, operate and maintain roads, maintenance equipment, and public service vehicles. | 79 | 82 | 629 | — | 4.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cooperative Development 0208 | Aimed at upgrading small farmer cooperatives' management capabilities and improving the members' numerical skills. Being implemented by the U.S.A. Cooperative League. | 80 | 85 | ___ | 483 | 483 |
| Albert Market 0211 | Socioeconomic study to rehabilitate and restore 160-year-old trading center. Implemented by Booker T. Washington Foundation. | 80 | 82 | 393 | ___ | 393 |
| Integrated Rural Development 0217 (PVO) | | 81 | 82 | ___ | ___ | 300 |

Source: Annual Budget Submission FY83, Gambia, June 1981; FY82 Congressional Presentation, interviews with AFR/DR program officer for Gambia.

Table III-2. Selected AID-Supported Projects in Gambia

| Project Name and Number 635-- | Primary AID-Supported Components | Potential Preparedness Activity |
|---|---|---|
| Soil and Water Management 0202 | Technical Assistance<br>Long- and short-term.<br>Training<br>In-country and U.S. | Provide preparedness training on environmental hazards and management for graudate students in agriculture, forestry and soil science studying in the southeastern United States.<br><br>Augument the project's efforts through short-term assistance to strengthen the Soil and Water Management Unit's capacity to monitor creeping emergency situations and take steps to avert greater environmental deterioration. |
| Mixed Farming and Resource Management 0203 | Technical Assistance<br>Long- and short-term.<br>Construction and Transport<br>Training<br>In-country, third-country, and the U.S. | Short-term technical assistance to introduce preparedness information to farmers by augmenting the project's efforts to help the departments of Agriculture and Animal Health and Production provide extension services.<br><br>Identify the 10 mid-and upper-level Ministry of Agriculture and Natural Resources staff receiving U.S. graduate-level education in communications, ag economics, agronomy, extension education, and rural sociology, and plan a seminar for them on preparedness in Gambia. They should be nearing completion of their course work as indicated by the project paper. |

proposed health centers throughout the country. AID would also help improve the drug supply system and integrate family planning activities in the program's maternal child health care component.

There are two projects which seem to have potential preparedness opportunities. They are the Soil and Water Management Unit Project and the Mixed Farming and Resource Management Project. These interventions can be classified as technical assistance and training. Both projects send graduates students to the United States to receive two-to-three years' education in communications, agriculture, agronomy, animal science, forestry, rural sociology, extension education agricultural economics, and soil science. A seminar could be prepared in the context of their educational programs to introduce preparedness planning concepts designed with special reference to the Gambia and its particular problems.

In additional to training, both projects offer opportunities to augment planned project activities through short-term technical assistance. The Soil and Water Management Project is designed to strengthen the newly established Soil and Water Management Unit capacity. An opportunity might exist to introduce a monitoring system to identify and measure creeping environmental deterioration and recommend steps to avert greater disaster. The Mixed Farming and Resource Management project might also offer a short-term technical assistance opportunity to disseminate preparedness information to farmers through planned project activities. This would help the Departments of Agriculture and Animal Health and Production to teach Gambian farmers about improved technology and farming practices.

## Other Donor-Assisted Projects

As a result of this summer's armed rebellion, several international organizations were involved in an emergency assistance operation. No details are available from UNDP or UNDRO on this latest emergency, but the nature of WHO assistance will be discussed in a later section.

The World Bank, UNDP, and UNICEF all have small development programs in the Gambia, and it is doubted that the recent crisis significantly disrupted activities. The following discussion reviews some of these ongoing development activities.

### UNICEF

From 1975 to 1980, UNICEF's program concentrated on basic maternal and child health, rural water supply, community development, primary education, and project support communi-

cations. The 1981-84 program will continue to emphasize these areas with several components receiving increased emphasis. An expanded immunization program will place new emphasis on controlling diarrheal diseases by promoting homemade oral rehydration salt use.

In the water and sanitation sector, UNICEF's program will depend upon supplementary funding availability. If these funds do not become available, efforts will be concentrated on health education related to proper water use, sanitation, and hygiene. UNICEF intends to become involved in well construction and sanitation facility improvement.

In non-formal education, UNICEF continues to promote integrating existing resources for the design, production, and dissemination of health and nutrition information. Cooperation with a UNFPA/UNESCO project on development communications should start in 1981. Table III-3 illustrates the proposed 1981-84 UNICEF program.

UNDRO

UNDRO contributed $20,000 towards alleviating the 1978 Banjul power shortage emergency. It participated in a United Nations mission to the Gambia to evaluate problems related to the power failure and help plan more permanent solutions. For some months prior to this emergency, difficulties had been experienced in maintaining the country's power-generating capacity. By July 1978 it had fallen to a critically low level, seriously affecting all areas of life and health. The government appealed to the United Nations for help and an emergency rescue operation was mounted by UNDP and the United States. Two generators were flown from the United States to Dakar, Senegal and moved by road to Banjul. Soon afterward, UNIDO joined UNDRO in a post-emergency assessment and submitted a report to the GOTG.

World Bank

The World Bank has invested a $27.4 million in the Gambia from 1972 to the present. Of this, current projects are valued at $17.5 million (Table III-4). The World Bank's primary ongoing activities focus on education and highway maintenance. Reviewing the current project appraisal reports reveals few opportunities for complementary preparedness interventions. However, the proposed Agricultural Development Project (AID is also a donor) offers potential opportunities for preparedness information to farmers, and food and livestock monitoring and surveilance systems. This project's appraisal has been delayed, but its progress should be closely watched in order to initiate timely discussions that include preparedness activities as part of the project.

Table III-3. Proposed UNICEF Program of Cooperation in Gambia 1981-84 ($US 000)

| Commitments and Notings | Probable Yearly Call-Forwards 1981 | 1982 | 1983 | 1984 | Total |
|---|---|---|---|---|---|
| **Commitments** | | | | | |
| Balance of commitments for future call-forwards as of January 1, 1981 | 115 | 116 | 42 | -- | 273 |
| Projected future commitments to be prepared | -- | -- | 115 | 180 | 295 |
| Total commitments | 164 | 116 | 157 | 180 | 617 |
| **Notings** | | | | | |
| Notings awaiting funding as of January 1, 1981 | 150 | -- | -- | -- | 150 |
| Proposed 1981 Board noting | | 300 | 100 | | 400 |
| Project future notings to be prepared | | 100 | 500 | | 900 |
| Total notings | 150 | 400 | 400 | 500 | 1450 |
| Total actual and projected commitments and notings | 314 | 516 | 557 | 680 | 2067 |
| **Breakdown of Total by Field of Assistance** | | | | | |
| Child Health | 63 | 65 | 69 | 80 | 277 |
| Water Supply and Sanitation | 199 | 400 | 420 | 522 | 1541 |
| Social Welfare Services for Children | 34 | 32 | 43 | 48 | 157 |
| Formal Education | 8 | 5 | 7 | 10 | 30 |
| Non-Formal Education | 10 | 14 | 18 | 20 | 62 |
| (Urban programs: d...tributed among preceding h dings) | (10) | (10) | (11) | (13) | (44) |

Source: UNICEF country Programme Profile, Gambia, April 1981, E/ICEF/P/L. 2065(REC)

Table III-4. Current World Bank Program in Gambia

| Project Name | Credit Number | Effective Date | Closing Date | Original Principal ($US millions) |
|---|---|---|---|---|
| Infrastructure and Tourism | 602-0 | December 1976 | June 1982 | 4.0 |
| Education | 792-0 | October 1978 | June 1983 | 5.5 |
| Rural and Urban Enterprises | 814-0 | September 1978 | December 1982 | 3.0 |
| Highway Maintenance | 897-0 | July 1979 | December 1984 | 5.0 |
| Total Project Commitments | | | | 17.0 |

Source: International Development Association, Statement of Development Credits, August 31, 1981.

[a] Only those projects whose closing dates occur after November 1981 are presented here.

A second proposed World-Bank-financed project with some potential relevance to emergency food distribution is the Second Banjul Port Project. This project's appraisal report is not yet available, but should be closely examined. The project is intended to rehabilitate Banjul Port facilities by providing construction and engineering assistance. It seems a management component concerning emergency shipments would be an appropriate parallel activity which could be introduced in connection with this project.

The World Bank is also financing another proposed project relating to the 1978 power shortage emergency. This energy project involves power sector planning assistance. Table III-5 gives additional information on these proposed projects.

World Health Organization

WHO was the first organization to be approached before any official GOTG appeal was made to the United Nations during the political crisis this summer. A total of $20,000 in supplies and technical assistance to help handle the heavy surgical overload was provided. Subsequently WHO was part of a United Nations multi-agency emergency mission preceeding to the Gambia to evaluate emergency needs.

WHO has a program coordinator in Banjul and its Primary Health Care Program (which AID proposes to assist) started this year. The recent emergency disrupted this project considerably, delaying project progress after the project medical officer was shot and seriously wounded. This was a considerable setback, and steps are now being taken to remedy the loss.

Before recommending preparedness activities in conjunction with the WHO Primary Health Care Project, the project's status and the nature of AID's proposed participation should be assessed.

UNDP

The UNDP Country Program for Gambia for 1977-81 was unavailable. Therefore, the following information on UNDP assistance program size is fragmentary. Table III-6 presents a selected listing of UNDP-financed projects. Regional projects are described in chapter nine.

The ongoing UNDP-financed Economic Planning Project has some potential for preparedness activity. This project assistance is designed to establish a system of national development planning, train planning officers, strengthen the planning organization, and improve planning procedures. Some appropriate technical assistance to assess and improve Gambia's national disaster plan might be a possible activity to be taken in conjunction with this project.

Table III-5. Proposed World Bank-Financed Projects in the Gambia

| Project Name | Government Agency | Description | Total IDA Commitment ($US million) | Status |
|---|---|---|---|---|
| Agricultural Development (Rural Development Project CR 644, Phase II | Ministry of Agriculture and Natural Resources | Support for traditional farmers, including extension, input supply, and marketing services on country-wide basis. Establishing national seed multiplication scheme and research into irrigated and upland food crops. Support for livestock marketing and rehabilitating small irrigation schemes. | 8.0[a] | Appraisal delayed pending credit system reorganization and strengthening management under First Rural Development Project. |
| Second Banjul Port | Ports Authority | Rehabilitating Banjul Port facilities; constructing new berth, cargo handling equipment, technical assistance. Detailed engineering underway. | 6.5[b] | Appraisal scheduled for June 1981. |
| Energy | Ministry of Economic Planning and Industrial Development | Technical assistance for geophysical studies; planning; power sector assistance; and forestry sector planning assistance. | 1.5 | Negotiations in early June. |

a Possible d co-financiers: ODA, IFAD, USAID

b Possible co-financing with ADB, and Germany

Source: World Bank Monthly Operational Summary, June 1981, Johns Hopkins University Press.

Table III-6. Selected UNDP-Financed Projects in the Gambia

| Project Name | Description | Period of Execution | Executing Agency | Total UNDP Contribution ($US 000) |
|---|---|---|---|---|
| Economic Planning | To help the government establish a system of national development planning suited to the needs of the country and its economic, social, political, and administrative institutions. | 1976-81 | United Nations | 1,295,800 |
| Agricultural | To increase agricultural production in order to eliminate bulk cereal imports, especially of rice, by providing planning assistance to the Ministry of Agriculture and National Resources. | 1978-81 | FAO | 939,800 |
| Hydrometeorological Project | To strengthen the indigenous capacity of the Department of Hydrometeorological Services in hydrological and meteorological activities and train personnel necessary to operate the services. | 1978-82 | WMO | 505,000 |

Source: UNDP area officer for Gambia and internal UNDP documents.

The Agricultural Planning Project has parallel objectives and activities and is designed to strengthen the capacity of the Programming and Project Management Unit within the Ministry of Agriculture and Natural Resources. This project may also offer similar potential for introducing preparedness planning.

## Conclusions

The following potential preparedness opportunities may exist in conjunction with bilaterial national programs in the Gambia:

- Identify Gambian students in the United States under the Soil and Water Management and Mixed Farming and Resource Management projects and introduce training exercises focusing on emergency preparedness for the Gambia.
- Help the Soil and Water Management Unit detect "creeping" disasters by strengthening its capacity to design an environmental monitoring and surveillance plan and put it into operation.
- Help the Department of Agriculture and Animal Health and Production make greater use of extension surveys in emergency preparedness.
- Determine the nature of the emergency planning role that could be integrated into the design of the proposed Primary Health Care Project.
- Determine the results of UNDRO's post-emergency assessment of the 1978 power shortage emergency and the nature of any follow-up activity for possible preparedness interventions.
- Determine what role agricultural extension and livestock monitoring and surveillance might play in the proposed World Bank-led Agricultural Development Project.
- Determine what role preparedness planning and management could play as a complementary activity to the World Bank's Banjul Port Improvement Project.

## NOTES TO CHAPTER THREE

1. AID, Gambia Mixed Farming and Resource Management Project Paper, July 1979, p. 1.

2. OFDA, Disaster History Assistance List, Gambia printout, 1981.

3. Mixed Farming Project Paper, p. 1.

4. AID, Gambia Soil and Water Management Unit Project, February 1978, p. 13.

5. FY82 Congressional Presentation, Gambia, 1981.

6. Ibid.

# CHAPTER FOUR

## MALI

Mali is a landlocked country east of Senegal with a total area of 1.24 million sq km and 6.3 million people. About 90 percent of the population is engaged in agriculture or related pursuits. Per capita income is only $110 per year, making Mali one of the world's 25 poorest countries.

Most of Mali is dry, since practically no rain falls north of the nineteenth parallel. Virtually the entire population lives in the country's southern half. Rainfall increases toward the south from 230 mm annual average around Gao, to 500 mm around Mopti, to over 1200 mm in the sudano-guinean zone around the Kayes-Bamako-Sikasso and Haute Vallee areas where most people live. Rainfall is extremely erratic from year to year, and its fluctuations determine agricultural yields.

Less than one-fourth of Mali receives over 500 mm of rainfall in normal years and is suitable for crop production. One-third of the country is Sahelian, suitable only for stockraising, and more than 40 percent is desert, totally unsuitable for agriculture. Because of the country's size and the low population density, the per capita endowment of arable land is still higher than other Sahelian countries. In this regard, Mali is about 50 percent better off than Sahelian countries as a whole, and 100 percent better with respect to grazing land, not only in terms of area, but also in terms of quality. As a result, agrarian and grazing pressures on the natural forest cover are significantly less than in other Sahelian countries.

Cotton and groundnuts are the country's main cash and export crop. Major food crops are millet, sorghum, and paddy. In years of satisfactory rainfall, an estimated 1 million tons of millet and 250,000 tons of rice are produced--levels making significant cereal imports unnecessary.

Prior to the drought, cattle and sheep flock production was the highest in francophone West Africa. Cattle is still an important source of revenue, providing slightly less than half of the value of agricultural output. Exports of live cattle were significant, until the drought, and herds have not yet fully recovered from losses during the drought years.

Establishing a consistent and manageable water supply is one of Mali's most persistent problems affecting economic development. The Niger and Senengal rivers provide Mali with an irregular water supply. The planned development of these water resources will enhance the potential for irrigated agriculture and lead to increased food production.

The effects of the early 1970's drought have been amplified by human and livestock population increases beginning in the 1950s. These set into motion a series of events resulting in the desertification of large areas of the country. Major Malian environmental problems associated with this desertification include:

- Soil erosion and degradation;
- Deforestation;
- Rangeland degradation; and
- Health hazards.

This chapter will discuss some of the most serious disaster hazards Mali faces and steps the donor community has taken to combat these hazards and environmental degradation problems.

## DISASTER IN MALI

Since 1966, over $65 million in U.S. disaster assistance has been directed toward alleviating drought-produced suffering in Mali. Over $110,000 was required during the same period because of meningitis and yellow fever epidemics[1].

Fire is another potential Malian disaster hazard, but one not requiring international assistance. Fires are set to improve pasturage and clear agricultural residues. Burning causes considerable soil destruction and can damage woodlands when the fires escape uncontrolled. However, forest area loss from uncontrolled brushfires is apparently less important than loss from fuelwood demand-- a major cause of soil damage. Brushfire damage is more serious when it leads to wind erosion as in Mopti, where smoked fish industry charcoal needs have used up all forest within 50 km of the city.

Mali suffers considerably from erratic rainfall which influences food production levels each year. However, very serious man-made environmental hazards also exist that prohibit full use of the existing natural resources and present potential population dangers. The following discussion will identify how these environmental factors interact with Malian food production and health care.

Drought and Food Production

Agriculture is the mainstay of the Mailian economy, but production is heavily dependent upon uncertain rainfall. Nine of the last 15 years have been drought-prone to the extent that the Government of the Republic of Mali (GRM) has requested international assistance. There has been some food production improvement since the early 1970s drought, and in most years the country is nearly self-sufficient in food.

Part of Mali's problem in reaching its full agricultural production potential is due to rainfall. Although total rainfall in many Malian areas equals that of U.S. cornbelt states, it falls during a four-month period when virtually all crops must grow. Near-normal rainfall in recent years has allowed subsistence farmers to build village stocks and market surpluses in some areas. At the same time, drought-reduced livestock herds have been largely replenished and some of the range land is beginning to regenerate.

Several factors impede progress in recovering from the drought. Roads, basic agricultural inputs (plows and improved seeds), and improved marketing systems are needed to expand agricultural production. Small-scale irrigation systems using rivers that traverse the country hold promise for maintaining production during poor rainfall years. Mali has the potential for substantial increases in irrigated areas. Better marketing systems and animal health and extension services will enable significant number of Malians in remote areas to improve their livestock-dependent livelihoods.

Another critical constraint to Mali's development is its landlocked location. The long distances to the port cities of Dakar and Abidjan mean lower net foreign exchange earnings from exports and higher delivery costs for imports. Some goods such as foodgrains cost more to transport from the ports to their final destination than to initially purchase and transport them from the West African coast.

Traditional and institutional factors also retard development. Inappropriate tilling and planting practices have depleted soil fertility. Overgrazing continues to threaten range lands. An oversized bureaucracy, cumbersome administrative procedures, and heavy recurrent costs are also constraints. The government's cereals marketing policy does not provide an adequate incentive for grain farmers to produce up to their full capacity, but the government has recently taken steps to reform this policy. Still, increased food production depends on such parallel actions as constructing and upgrading farm-to-market roads and irrigation facilities, and developing techniques and instruction in appropriate production, energy use, and environmental practices at the village level.

Rivers and lakes, groundwater and surface water are also key development resources subject to wide annual variation caused by rainfall within Mali and to the south. The headwaters of both the Niger and Senegal rivers are located in Guinea's tropical forests and they traverse the opposite sides of Mali. Both are subject to wide flood-level variations which have important implications for transportation, irrigation, and hydroelectric power generation. The Niger provides an essential transportation link to the east and north of Bamako and is essential for fishing, farming, and herding enterprises. Traditional flood recession and residual moisture cultivation is practiced throughout Niger's vast inland deltas. The Senegal River's irrigation potential is less than the Niger's, but both are underutilized due to poor management and inadquate market incentives to producers, among other factors. Development of both river basins should produce important benefits for Malian agriculture.

## Epidemics and Health Care

Malian health problems typify those in Sahilian West Africa. High morbidity and mortality levels from infections and parasitic diseases, especially in combination with early childhood malnutrition, are reflected in the most recent estimates of infant mortality rates (188 per 1,000) and a 25.9 per 1,000 death rate[2].

In addition to major nationwide disease burdens from gastrointenstinal, respiratory, and skin infections, childhood communicable diseases (especially measles and pertussis), malaria, tetanus, schistosomiasis, and leprosy, some of Mali's potentially most productive and better-watered areas are major sites for onchocerciasis (river blindness). This disease has signficant economic implications since it encourages population out-migration and causes increased dependency ratios resulting from blindness. Studies in some high-prevalence onchocerciasis areas have shown more than 10 percent of the affected population, including many working-aged adults, are blind.

Mali's current 2.5 percent population growth rate is a serious problem, but the GRM does not consider high fertility to be among its most significant rural health problems.

The nature and organization of the Malian health care resources available to deal with these problems are inadequate. The Ministry of Health (MOH) organizational structure is typical of francophone Africa. Health facilities and personnel correspond to general public administration levels. There is essentially no provision for village-level health services except for rare contacts with categorical preventative programs to combat certain endemic diseases (Service de Grandes Endemies).

Not more than 15 percent of the population has access to modern health services. In the last 20 years, the quality of health services provided to even this group has not signficantly improved. In fact, there are indications health services may have deterioriated in the urban centers where more health resources are concentrated.

Not all Malian health problems affect only the rural sector. The urban population is also severely affected by water-related diseases. For example, less than one-third of urban residents have access to portable water. A housing shortage affects all income levels but falls most heavily upon the poor. Sewage systems and garbage disposal facilities in Bamako meet only one-third of the city's needs. Open cesspools, garbage piles, and uncovered latrines breed the insects transmitting a host of diseases--including malaria, the major cause of death of children under five[3]. The growing cities offer diversions not found in the countryside, but Malian city dwellers are not necessarily better off.

There are several major constraints to improving Malian health care. Although approximately 7 percent of the national budget is devoted to health services, the health budget for the last five years has remained stable at $2 per person annually. Such limited financial resources means drugs, medical equipment, and vehicles are chronically lacking. Health facilities also lack both quantity and quality. Mali has two national and six regional hospitals, 46 health centers, and 400 dispensaries. While these facilities constitute an infrastructure skeleton, linkages between different levels are weak due to bad roads, lack of transportation, and poor communications.

Despite this grim picture, Malian health care does have some strengths. The MOH has a sound strategy--primary health care stressing rural coverage. There is a medical school and two nursing schools. (The AID centrally-funded INTRAH project helps improve teaching methodolgy and curriculum in several nursing schools.) Further training priorities focus on public health areas, particularly in planning and management. Unfortunately, budget allocations and personnel incentive systems continue to be biased in favor of urban health centers.

External assistance donors play important health sector roles. France, the USSR, and China provide urban-centered medical teams. Germany, France, and WHO are carrying out national and regional research projects in leprosy, onchocerciasis, and schistosomiasis. UNFPA and private agencies carry out mother/child rural area health projects. All donors provide medications, but control and standardization are lacking. USAID/Bamako is financing a pilot rural health project to devise a system for delivering affordable basic health services to villagers as a basis for a national rural health service. The World Bank is planning a closely related national rural health project.

## DISASTER PREPAREDNESS IN MALI

The GRM has no disaster plan but it does have an organization of ministers which meets to coordinate emergency assistance. The committee's composition includes the ministers of interior and national defense, education, health, social welfare, labor, production and agriculture, public works, and the Gendarmerie Nationale which is responsible for distributing foreign donor relief.

Mali has limited resources available for disaster response, and there is no indication of how this Sahel Disaster Relief Organization gets its information or whether it meets to discuss preparedness planning. Further investigations are needed to determine the extent to which this is a functioning and viable unit through which preparedness planning could be introduced.

## AID ASSISTANCE STRATEGY IN MALI

AID's current development program emerged from Mali's drought relief assistance and a period of planning and project design in collaboration with the government. Its principal goal is to support Mali's efforts to achieve food production self-sufficiency and improve the quality of rural life. AID's program helps rural development operations and smaller-scale actions raise millet, sorghum, rise, and wheat yields as well as introduce improved extension systems and social and economic amenities such as functional literacy, improved water control, farm-to-market roads, and marketing and credit systems. Other AID projects emphasize better rural health delivery systems, building village roads, improving rural transport infrastructure, and improving renewable energy sources for village use. AID's proposed FY82 budget is $15.3 million, while the proposed FY83 AAPL is $11 million.

USAID/Bamako's primary goals are to improve both agricultural productivity and the population's health and nutrition. This two-part approach focuses primarily on food production and income in selected areas, and secondarily on selectively developing a national rural health system. Supporting activities are proposed for projects in small infrastructures, functional literacy, village reforestation, energy, and women's training, all directly tied to agricultural production increases. In support of both increased agricultural production and improved health care, overseas participant training and in-country training will be programmed to address key managerial needs(Table IV-1).

Table IV-1. Selected Ongoing and Proposed AID-Supported Projects in Mali

| Project Name and Number 688-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Operation Mils II 0202 | To increase agricultural production and and Fifth Region family welfare; and help Operation Mils (Mopti) develop an effective agricultural development planning capacity, improve millet and sorghum research facilities, develop extension agent training programs, construct village-level storage facilities, and provide technical assistance to vegetable, millet, and sorghum production. | 80 | 84 | -- | -- | 9,900 |
| Livestock Sector I 0203 | To increase the welfare of Mali's small herders and farmers by improving the livestock industry; develop controlled range management systems including constructing and developing the Dilly Training Center with water points, firebreaks, livestock vaccination park, herder associations, and an airfield; construct a training institution to develop instructional materials and teach livestock production and range management techniques and effective communication with livestock producers; study tse tse fly distribution, population dynamics, and the incidence and prevalance of trypanosomiasis; and propose a disease control program. | 75 | 82 | -- | -- | 17,100 |
| Land Use Inventory 205 | To perform an inventory of land and water resources and assist GOM develop a capacity to plan for effective resource use. | 78 | 81 | -- | -- | 3,269 |
| Action Riz-Sorgho 0206 | To increase Seventh Region cereal production; construct permanent dikes and water gates along the Niger River; establish a research station to determine technological packages suitable for the area; and train Action Riz-Sorgho extension personnel and farmers. | 76 | 82 | -- | -- | 4,900 |

Table IV-1. (Continued)

| Project Name and Number 688-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Project Cost Total LOP Authorization ($US 000) |
|---|---|---|---|---|---|---|
| Agricultural Officers Training 0207 | To improve support to national agricultural programs by expanding and improving of Agricultural Apprenticeship Centers to train increased numbers of higher quality mid-level agricultural extension officers and construct new facility at Same in the First Region; provide equipment and furnishings; provide instructor training; and develop curriculum based on practical applications production practices. | 77 | 84 | -- | -- | 7,020 |
| Rural Health Services Department 0208 | To design, implement, and evaluate a low-cost rural health system to serve as basis for a national system within Mali's financial means that includes training existing health personnel and village health workers in primary health care; and establish a logistical support system for selling and distributing basic medications. | 77 | 82 | -- | -- | 3,900 |
| Operation Haute Vallee 0210 | To increase food crop productivity and marketing throughout the Haute Vallee including rehabilitating rice polders, constructing market access roads and trails, establishing a farmer credit program and animal traction centers, expanding functional literacy and health services, integrating livestock and crop production, and training project personnel. | 78 | 83 | -- | 3,000 | 18,400 |
| Action Ble 0213 | To help meet the chronic food deficit of Mali's northern regions and provide part of the southern region's requirements through increased cereals production, including provision of a credit fund for agricultural inputs and irrigation pumps, constructing warehouses, and training in extension, management, and marketing. | 78 | 84 | 620 | 450 | 4,400 |

Table IV-1. (Continued)

| Project Name and Number 688-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL. ($US 000) | Project Cost FY 83 AAPL ($US 000) | Project Cost Total LOP Authorization ($US 000) |
|---|---|---|---|---|---|---|
| Renewable Energy 0217 | To demonstrate feasibility of small-scale renewable energy technologies for rural development including constructing and equiping a new Solar Energy Lab; research and development support; surveys of village-level energy resources and needs; technical and survey training; and fabricatiion and testing of renewable energy devices and evaluation. | 78 | 83 | 1,100 | 700 | 4,100 |
| Livestock Sector II 0218 | Same objectives as Livestock I (0203) although extended in scope. Nature of that extension yet to be determined. | 82 | 86 | 5,250 | 2,050 | 20,100 |
| Development Leadership Training 0221 | To improve management of major Malian institutions by training 60 of Mali's potential future leaders in areas of economic planing, public administration, business administration and finance, and educational planning. | 81 | 85 | 1,000 | 1,000 | 4,600 |
| Action Riz-Sorgho Phase II 0223 | To increase yields and total cereal grain production in the Seventh Region through an improved system of adaptive research, extension, and training; improve transmission of improved and adapted agricultural technologies to rural rice and sorghum farmers. | 82 | 84 | 500 | 300 | 1,000 |
| Training Center for Rural Women 0225 | To develop the capacity of the National Union of Malian Women to provide practical, multidisciplinary training in development promotion to rural women. | 80 | 83 | -- | -- | 500 |
| Semi-arid Tropical Crops Research Phase II 0226 | To develop a series of technical farming approaches based on adaptive research on millet, sorghum, and other grains in Mali's semi-arid rainfall zones and make these approaches available to small farmers. Will continue to expand ICRISAT research primarily by developing new varieties and pest resistence while maintaining palatability. Improved farming systems and agronomic practices are related project activities. | 81 | 85 | 710 | 780 | 3,800 |

Table IV-1. (Continued)

| Project Name and Number 688-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Project Cost Total LOP Authorization ($US 000) |
|---|---|---|---|---|---|---|
| Rural Health Phase II 0227 | To improve primary health care and family planning services by strengthening national health institutions and expanding the rural health system in the Fifth Region (Mopti). | 83 | 87 | -- | 950 | 4,300 |
| Development Management Training 0228 | To improve Malian government implementation of AID-funded projects by providing management personnel with consultation and training on financial and operation management problem-solving and explore the possibilities for institutionalizing management training incountry. | 83 | 88 | -- | 200 | 6,000 |
| Village Reforestation (no number available) | To idearify successful and cost-effective processes for achieving reforestation and more efficient water and forestry service, including establishment of tree nurseries with demonstration plots, experimental fields, and construction of storerooms and offices. | 80 | 85 | -- | -- | 500 |
| Rural Water Improvement (no number available) | To increase the quality and quantity of drinking water in the arrondissement of Ouelessebougou. | 80 | 82 | -- | -- | 259 |
| Kayes to Nioro Road | To provide the detailed technical design component for constructing the road from Kayes to Nioro. | 80 | 83 | n.a. | n.a. | 2,400 |

Sources: FY82 Congressional Presentation, FY83 Annual Budget Submission, Mali, June 1981, Mission Briefing Papaer, February 1981, interviews with AFR/DR Program Officer, Mali.

n.a. Not available

The USAID/Bamako-proposed integrated crops and livestock approach will be carried out through a series of area development projects aimed at producing a primary crop or a combination of crops best suited for the area, climate, and soil conditions, and a national livestock sector project, focusing on selected areas and providing an animal health services for the national herds. The area crops production projects will be carried out by rural development operations which are Ministry of Agriculture administrative entities with authority to administer a broad range of farmer services in their respective areas. The livestock sector is managed by the Ministry of Livestock, Water and Forests which is responsible for planning all land use, managing range land, and administering animal health and production services.

USAID/Bamako's Rural Health Project mid-course evaluation found that basic affordable health services could be provided to Fifth region Koro district villagers if national and regional supporting systems were maintained at efficient levels. To build up on the Koro experience, USAID/Bamako proposes to collaborate with other donors and design a second phase rural health project for a MOH-operated national rural system. Other donors are expected to be the World Bank, WHO, West Germany, France, and possibly China, as well as other smaller bilateral and multilateral nongovernmental donor organizations.

The following section discusses these projects in more detail (including the P.L. 480 program) and identifies potential disaster preparedness opportunities within these projects.

## PROJECT ANALYSIS

Mali receives development assistance from a wide variety of bilateral donors, regional and international organizations, and voluntary agencies. This discussion focuses only on those national development programs supported by AID, the World Bank, UNICEF, and UNDP. A discussion of regional projects operating in Mali are found in chapter nine.

### AID-Supported Projects

Much of USAID/Bamako's assistance program is directed toward increased crop and livestock production. USAID/Bamako is continuing to gather and consolidate data on land utilization, farming systems, improved crop varieties, and forage production. Financed under both the bilateral program and Sahel regional program, these projects provide an information network actively being applied to crop and livestock projects. This chapter reviews only projects financed under the bilateral program. Chapter nine gives an overview of the Sahel regional program.

## Current Projects

Two current projects among those terminating in FY83 and beyond have activities related very strongly to emergency preparedness planning and training. The Development Leadership Training Project, for example, provides an excellent opportunity to identify a complementary preparedness training activity to take advantage of Malian students studying for public management graduate degrees in the United States. An opportunity also exists for a follow up activity in Mali, as USAID/Bamako plans an annual symposium on development management problems involving these students. This might provide another forum for discussing the need for a national emergency plan. The project's purpose is to strengthen Mali's parastatal companies which are, in many cases, the executing agencies for government rural development programs. This could represent an ideal opportunity to reach future Malian leaders with the need for emergency preparedness.

In addition to these two activities, the Rural Health Services Development Project also presents potential preparedness opportunities. This project has a participant training component for senior level MOH officials in health policy and management. Discussions could be initiated with Johns Hopkins and Harvard universities to integrate health emergency planning within the short-term courses offered to these students. A complementary activity might involve initiating discussions with MOH personnel to design and test the rural application of a national health emergency plan. The Rural Health Service Development Project could be used as a model for extending national-level health sector planning to rural areas. Table IV-2 identifies AID-supported components of these projects and their associated preparedness needs.

## Proposed Projects

There are two projects proposed to be designed in FY82 with possible potential for emergency preparedness planning: They are the Rural Health Development Project Phase II and the Development Management Training Project.

Rural Health Development Project activities will be extended into other geographic areas during Phase II. Since this is the only continuing AID-supported health sector activity in Mali, it provides the only real opportunity to work with various levels of MOH personnel to design and test a health emergency plan. The Development Management Training Project is in one sense a companion project to the Development Leadership Training Project. This project provides long-term academic training for Malian leaders in public administration, business administration, economic planning, and education planning and finance. The

Table IV-2. Selected Ongoing and Proposed AID-Supported Projects In Mali and their Associated Preparedness Needs

| Project Title and Number 688-- | Primary AID-Supported Components | Potential Preparedness Activity |
|---|---|---|
| Rural Health Services Development 0208 | Technical Assistance<br>Long-term and short-term in the development, realization, and evaluation of community health services in demonstration areas. | Initiate discussions with MOH personnel to design and test rural health emergency plan linked to a national plan, using the low-cost model the project introduces. |
| | Equipment and Commodities<br>Supplying equipment, drugs, and material for use in demonstration areas within proposed model. | Identify complementary training activity for students receiving U.S. graduate education (one-year programs) and short-term training in 2 to 3 month non-degree programs for senior-level MOH officials in health policy and management (Harvard) and planning (Johns Hopkins). |
| | Participant Training<br>U.S. and local training focusing on village health workers and various levels of supervisory workers at arrondessement, cercle, and regional levels. At national level, training is focused on improving administrative, supply, and logistic capabilities. | |
| Development Leadership Training 0221 | Long-Term Training<br>Training for 60 potential future leaders in management, public administration, business administration and finance, economic planning and education planning, programming, and evaluation. | Identify complementary training activity for students attending U.S. graduate schools. Plan for follow up activity in conjunction with annual AID symposium on management development problems to discuss emergency management related to Mali. |

Development Managment Training Project will provide consultancies, on-the-job training and in-country seminars, to integrate other projects' training programs and build the management capacity at key levels of Malian society. These activities will take place in-country and might provide the opportunity to design an emergency management component in the project design stage. In both cases, discussions should be initiated with USAID/Bamako to determine such an intervention's feasibility and the timing for project design activities.

P.L. 480 Title II

Mali received large quantities of U.S. and other external food assistance during the 1968-74 drought. It has continued to request and accept food assistance from the donor community, notably from the World Food Program, European Economic Community, France, and Germany. The GRM management of the official cereals marketing system has kept grain prices artificially low to consumers while depriving farmers of an acceptable return on their production. After a series of studies and problem reviews, the GRM approved, in principle, a multidonor proposal for cereals price policy reform in March 1981. This proposal calls for a five-year price restructuring program. During this period, official producer prices will be raised immediately to those of neighboring Sahelian countries while existing consumer price subsidies will be phased out entirely. External food assistance would be provided to the GRM to finance this consumer subsidy phase out under specific conditions tied to a restructured price policy program.

As soon as accountability for past food assistance has been determined, USAID/Bamako will confirm the pending proposal for emergency FY81 assistance. At the same time, REDSO/Washington or AID will be requested to negotiate agreement terms to design a detailed program for multi-year assistance tied to cereals market reform.

Other Donor-Assisted Projects

The World Bank, UNDP, and UNICEF all have sizeable Malian programs. From April 1977 to June 1981, UNDRO did not undertake any emergency relief or preparedness activities in Mali. The following discussion, therefore, focuses only upon UNICEF, UNDP, and World Bank-financed Malian programs.

## UNICEF

In April 1981, UNICEF evaluated its Malian program prior to negotiating the next five-year assistance program with the government. The content, and objectives of the 1982-86 program will be essentially the same as in 1979-81. See Table IV-3 for a breakdown by field of assistance of the proposed 1981-84 assistance program.

UNICEF is currently supporting the continued restructuring of the health delivery system in Mali dealing with health statistics, equiping rural dispensaries and maternity clinics, training primary health care workers, and conducting regional public health seminars to discuss national health care policy. These seminars might provide a forum for discussing formation of a national health emergency plan. Discussions with the UNICEF representative could take place to explore this idea.

UNICEF supports community development centers with educational, technical, and demonstration materials and transport. UNICEF also supports the continued review of the government's program for rural area basic education. It provides equipment for new rural area schools, finances students from general teacher-training institutions during their rural education courses, finances teacher refresher courses, provides equipment for school canteens; provides supplies and equipment for the National Pedagogical Institute, general teacher-training institutions, and the Women's Technical Training College. UNICEF's water supply efforts include intensified drilling in several areas and providing drilling equipment and assistance with pumping, water points, and sanitation systems.

UNICEF's 1981-83 program is designed to enable people to participate in development activities aimed mainly at health and education. Those activities include functional literacy campaigns, village plantations, small-scale stock raising, small dams, and so on. The goal is to make people more self-sufficient by developing their productive functions.

## World Bank

The World Bank has over $136.5 million worth of active projects in Mali as of November 1981. There is heavy investment in road building and maintenance, railway construction, and urban development. In the rural sector, the World Bank has invested in a substantial livestock project, the second phase of the Mopti Rice Production Project, forestry development, and the Mali-Sud Agricultural Project. The Mopti Rice and Mali-Sud Agricultural Projects may have some importance to emergency preparedness.

Table IV-3. Projected UNICEF Program of Coooperation, Mali, 1981-84 (Commitments and Notings)[a]

Probable Annual Call-Forwards ($US 000)

| | 1981 | 1982 | 1983 | 1984 | Total |
|---|---|---|---|---|---|
| Breakdown by Field of Assistance | | | | | |
| Child Health | 782 | 890 | 1108 | 1240 | 4020 |
| Water Supply | 850 | 1100 | 1290 | 1320 | 4570 |
| Child Nutrition | 48 | 170 | 220 | 270 | 708 |
| Social Welfare Services for Children | 174 | 250 | 300 | 320 | 1044 |
| Formal Education | 448 | 440 | 500 | 560 | 1948 |
| Non-Formal Education | 42 | 63 | 90 | 127 | 322 |
| Planning and Project Support Services | 9 | 15 | 20 | 40 | 84 |
| Miscellaneous | 20 | 30 | 35 | 50 | 135 |
| (urban programs broken down under preceeding headings) | (215) | (270) | (300) | (330) | (1115) |

[a] Actual and projected. Includes committed as well as requests for supplementary funding.

Source: UNICEF Country Programme Profile, Mali, May 1981, E/ICEF/P/L/2069 (REC).

Table IV-4 gives more information about the onogoing World Bank projects in Mali. Table IV-5 describes those projects being proposed for implementation.

UNDP

The 1977-81 Indicative Planning Figure (IPF) for UNDP assistance to Mali amounted to nearly $22 million. Table IV-6 illustrates the breakdown of this programming by sectors. The proposed IPF for 1982-86 was unavailable. The UNDP program stresses better organization of agricultural production, rural development and elimination of some major development constraints facing Mali. The agricultural sector continues to be the mainstay of the Malian program taking into account several geographic and socioeconomic development constraints:

- Climatic hazards and very unfavorable soil conditions;
- Consequences of the country's landlocked position and its size;
- Weakness of the infrastructure and communications system, especially the rural road network;
- Inadequate agronomic research on non-irrigated grain production;
- Weakness of supply machinery and non-existant rural credit system;
- Weak marketing and storage network;
- Adverse consequences of the agricultural prices policy;
- Need for balance between areas of extensive grazing and intensive agriculture;
- Importance of developing irrigated agriculture potential; and
- Inadequate management of national rangelands.

Table IV-7 presents a selected list of UNDP-financed projects which are ongoing or are being extended through 1982 and beyond.

Table IV-4. Selected Current World Bank-Financed Projects In Mali[a]

| Project Name | Credit Number | Effective Date | Closing Date | Original Principal ($US million) |
|---|---|---|---|---|
| Livestock | 538-0 | July 1975 | June 1982 | 13.3 |
| Second Highway | 383-1 | October 1975 | December 1981 | 8.3 |
| Third Highway | 599-0 | March 1976 | December 1981 | 10.0 |
| Mali-Sud Agricultural | 669-0 | September 1977 | June 1983 | 15.5 |
| Third Railway | 713-0 | November 1977 | June 1982 | 10.5 |
| Second Education | 733-0 | January 1978 | June 1983 | 10.0 |
| Second Mopti Rice | 753-0 | May 1978 | November 1983 | 15.0 |
| Technical Asisstance & Engineering | 854-0 | January 1979 | September 1982 | 4.5 |
| Forestry | 883-0 | May 1980 | December 1984 | 4.5 |
| Urban Development | 943-0 | June 1980 | December 1983 | 12.0 |
| Industrial Development | 986-0 | September 1980 | June 1985 | 8.0 |
| Road Maintenance | 1103-0 | n.a.[b] | n.a. | 15.2 |
| Petroleum Exploration Promotion | 1134-0 | n.a.[c] | n.a. | 3.5 |
| ODIPAC Technical Assistance | 1174-0 | n.a.[d] | n.a. | 6.2 |
| Total IDA credits still effective as of November 1981. | | | | $136.5 |

a Not closed as of November 1981.
b Agreement signed March 1981.
c Agreement signed April 1981.
d Approved July 1981, agreement not yet signed.

n.a. not available.

Source: International Development Association, Statement of Development Credits, August 31, 1981.

Table IV-5. Proposed World Bank Financed Projects in Mali

| Project Name | Government Agency | Description | Total IDA Commitment ($US millions) | Status |
|---|---|---|---|---|
| Technical Assistance to ODIPAC | Office de Developpement Integre d Arachides et de Cereales (ODIPAC) | To increase the efficiency of agricultural production by retraining extension staff; improving seed production, distribution, and storage, and overhauling the credit and marketing system; promoting the establishment of self-managed farmer organizations able to take over village development activities; and testing diversification programs to reduce the area's dependence on groundnuts as an export crop. | 5.8[a] | Negotiations underway. |
| Second Telecommunications Project | Office des Postes et de Telecommunications | Completion of Mali main transmissions route, including microwave section. Supply and installation of 1400 lines of switching equipment in four towns, including construction of telephone exchange buildings, rehabilitation and extension of local networks, providing engineering consultants for detailed engineering of network extensions, preparing bidding documents, and helping to organize maintenance programs; and providing consultants to study organization of postal and financial services and establishing training programs. | 10.8[b] | Consultants reports underway. |
| Office du Niger II | Office du Niger | Rehabilitating irrigation infrastructure of the Office du Niger and on-farm work affecting some 15,000-20,000 ha of rice fields. | 22.4 | Preparatory studies underway. |

Table IV-5. (Continued)

| Project Name | Government Agency | Description | Total IDA Commitment ($US millions) | Status |
|---|---|---|---|---|
| Gasohol Production | Office du Niger | Producing gasohol from surplus molasses; modifying existing distillation facilities and providing infrastructure to handle and store ethyl alcohol for eventual blending with gasoline. | 5.0 | Appraisal underway. |
| Power/Water | Energie du Mali | First phase of two-stage program to extend power distribution, rehabilitate utility, promote fuel savings through introducing biomass fuels, and initiate preliminary water sector reforms. | 20.0[d] | Negotiations schedule for end of June. |
| Rural Water Supply in the Western Region | Ministere de Developpment Industriel | To be executed in parallel with IDA Health Project. | 12.0 | Preparation of studies underway. |

a Co-financing with FAC envisaged.

b Co-financing with CCCE envisaged.

c Co-financing may be required.

d Co-financing being arranged.

Source: World Bank Monthly Operational Summary, Johns Hopkins University press, June 1981.

Table IV-6. Breakdown of 1977-81 UNDP Assistance Program for Mali By Sector (in $US000)

| Sectors | 1977 | 1978 | 1979 | 1980 | 1981 | Total |
|---|---|---|---|---|---|---|
| Rural Development | 718 | 1,950 | 2,801 | 1,876 | 485 | 7,830 |
| Development of Water Resources | 654 | 105 | 1,707 | 1,014 | 849 | 5,259 |
| Human Resources | 916 | 852 | 1,034 | 661 | 417 | 3,880 |
| Strengthening of Planning Machinery | 462 | 590 | 613 | 605 | 465 | 2,735 |
| Modern Sector Development | 233 | 283 | 482 | 325 | 134 | 1,457 |
| Transport and Communications | 5 | 250 | 128 | -- | -- | 383 |
| Amount Programmed | 2,988 | 2,960 | 6,765 | 4,481 | 2,350 | 21,544 |
| Reserve | | | | | | 375 |
| Total | | | | | | 21,919 |

Source: UNDP, Country Programme for Mali, September 1977, DP/GC/MLI/R.2.

Table IV-7. UNDP Assistance Program for Mali (1977-81)

| Project Name | Description | Executing Agency | Period of Assistance | Total UNDP Contribution ($US 000) |
|---|---|---|---|---|
| Seed Centers | To strengthen the production and equipment structures of the Babougou and Kayes farms to meet growing demand for seed and ensure the farms will produce even in drought years. | FAO | 1977-81 (being extended) | 2,224 |
| Improvement of the Production and Marketing of Livestock and Meat Products | To strengthen OMBEVI and its infrastructure and increase its technical staff; operate a pilot center for experimentation on production methods in Sahelian grazing conditions; and improve marketing of animal products and by-products. | FAO | 1978-83 | 2,590 |
| Groundwater Surveys and Development | To increase the physical and human resources of the groundwater division, in particular, to increase the number of drilling rigs available in the Department of Water Resources and Energy. | United Nations | 1977-83 | 8,000 |
| Central Planning Project | To assist the Ministry of Planning in planning and setting up a Central Project office; to provide a basic core of experts; train national personnel in preparation of investment brief and the processing of invitations to bid. | United Nations | 1979-82 | 1,097 |
| Technical Assistance Livestock Project in Senegal Oriental | To improve animal health, create an association of livestock producers to organize better livestock management, and improve extension services. | FAO | 1980-83 | 1,000 |
| Technical and Financial Assistance to EMAMA | To strengthen at the national and regional levels the ability to repair agricultural and transport vehicles and equipment. | UNIDO | 1981-ongoing | 57,000 |
| Assistance to the Productivity and Budget Management Institute | To provide graduates of higher educational institutes with further training in management; retrain senior and mid-level staff by introducing them to modern management techniques; provide the teaching staff of IPGP and other educational institutions with training. | United Nations | 1977-81 (being (extended) | 2,267 |

Table IV-7. (Continued)

| Project Name | Description | Executing Agency | Period of Assistance | Total UNDP Contribution ($US 000) |
|---|---|---|---|---|
| Animal Husbandry | n.a. | FAO | Ongoing, another phase projected | n.a. |
| Institute Pratique de Development Rural | n.a. | UNESCO | Ongoing | 1,500 |
| Rural University (preparatory phase) | Use of local language as language of instruction, promote local education and transfer of modern technology, research and exploitation of renewable energy resources. | UNESCO | 1980-ongoing | 30 |
| Agro-meteorological Project | n.a. | WMO | 1981-86 | n.a. |
| Family Life | n.a. | UNESCO | Ongoing | n.a. |
| Pharmaceutical Products Production | New project | n.a. | n.a. | n.a. |
| Strengthen the Department of Public Hygiene and Sanitation | n.a. | WHO | Ongoing | n.a. |
| Integrated Rural Development, Kolokani | Rural participation, economic and social development, health, education and literacy, appropriate technology and the use of renewable energy resources, artisanal industries, and the promotion of women. | UNDP/OPE | 1980-ongoing | 22 |

Source: UNDP area officer for Mali, UNDP Country Program for Mali, September 1977, DP/GC/MLI/R.2 and internal UNDP documentation.

## CONCLUSIONS

An analysis of donor-assisted development programs in Mali reveals the following potential preparedness opportunities:

- Initiate discussions with MOH personnel to design and test a rural health emergency plan linked to a national plan, using the low-cost model introduced by the Rural Health Services Development Project;

- Identify complementary training activities for students receiving U.S. graduate educations under the Rural Health Services Development Project;

- Initiate discussions with officials at Harvard and Johns Hopkins concerning the feasibility of introducing an emergency preparedness aspect to their health policy and managment and health planning short courses offered to Ministry of Health officials under the Rural Health Services Development Project;

- Plan complementary training activities for students at U.S. graduate schools studying under the Development Leadership Training Project;

- Plan for follow up activity in conjunction with annual USAID/Bamako symposium on managing development problems to discuss emergency management related to Mali;

- Initiate discussions with USAID/Bamako to determine if health preparedness planning might have a role to play in the second phase of the Rural Health Services Development Project to be designed in FY82; and

- Initiate discussions with USAID/Bamako to determine what role emergency management trainin might play in designing the Development Leadership Project scheduled for project preparation in FY82.

# NOTES TO CHAPTER FOUR

## MALI

1 OFDA, Disaster History Summary, printout, 1981.

2 AID, Mali Rural Health Services Development Project Paper, 1976, p. 12-13.

3 UNICEF, Country Programme Profile, Mali, May 1981, E/ICEF/P/L.2069(REC).

# CHAPTER FIVE

## MAURITANIA

Mauritania is predominantly a land of sparse vegetation. Some of its desert areas are among the world's most barren. While Mauritania experienced very uneven growth during the 1960s, a slowdown in growth and accelerated inflation occured in the 1970s due to several mutually reinforcing factors. Chronic drought conditions increased the country's reliance on food imports, energy prices rose, and high defense expenditures related to the Western Sahara dispute all sapped the economy.

In 1977 and 1978 per capita GDP was approximatly $365, although most recently available data indicate that figure may be slightly higher. The latest estimates, skewed by mining sector revenues, hide the abysmal poverty existing in Mauritania, one of the world's lowest income countries.

Mauritania's 1.5 million people occupy 1.2 million sq km of predominantly desert land. Rainfall averages between 36 mm in the coastal zone to 650 mm in the far southern Sahelian zone. Periodic drought seems to have characterized Mauritania's climate in this century. There was little rain in 1913 followed 30 years later by the 1940-42 drought[1]. The most recent drought lasted from 1970-75, and reoccurred in 1977-79.

Mauritania has four general geographical zones--Sahelian, coastal, Senegal River zone, and Saharan. Except for the small area along the Senegal River, Mauritania is a land of poor soils and scanty vegetation. About 40 percent of the land is covered with either fixed or mobile sand dunes. The Saharan zone's arid desert permits little vegetation. The only cultivation occurs in the oases, where date palms flourish and other crops are grown on a limited basis.

The coastal zone receives the least rainfall of any region, and is almost devoid of vegetation. Some scrub grasses and date palms grow in the Sahelian zone. Further south, the rain is sufficient to support agriculture, and millet, maize, and sorghum are grown. The Senegal River zone is an area of abundant vegetation. The flood plains are Mauritania's chief agricultural areas and provide the greatest prospect for increasing agricultural productivity.

Mauritania's vegetation is an especially fragile resource. This is particularly true in the Sahelian zone where, during the 1970s' drought, starving livestock further depleted the scant vegetation already in desperately short supply for lack of rain. Deprived of its fixed vegetative cover, winds blew away soil in many areas, thus contributing toward increased desertification.

Government development plans have called for extensive irrigation use, and several large hydro-agricultural projects are being planned. The Gorgol and Diama dam projects are currently in progress and when completed should provide irrigation waters to cultivate large areas.

Despite these largely undeveloped potential resources, Mauritania continues to be a disaster-prone country. The following discussion highlights the dynamics of its disaster/development cycle.

The Senegal River constitutes Mauritania's primary water resource. The river serves as the borrder between Senegal and Mauritania in the southwestern area of the country and is the country's only major non-seasonal stream. Senegal River delta waters between Rosso and the Atlantic are too salty for agricultural use. Other rivers are mostly temporary or seasonal in nature. These dried stream beds or wadis produce flows often several hundred kilometers in length when filled with rainwater. This overflow provides moisture for recession agriculture.

Groundwater resources of varying depth and quality are present throughout Mauritania and are a significant supply for human consumption, agriculture, and mining operations. No complete survey has been done or hydrological map yet produced, so it is difficult to estimate this potential resource's extent.

Presently most agricultural endeavors depend on seasonal floodwaters to meet their water needs. The Maures have traditionally built small rainwater-collecting earthen dams to water livestock and irrigate relatively small land areas.

## DISASTERS IN MAURITANIA

Mauritania's overwhelming disaster hazards are drought, environment degradation including desertification and deforestation, and health problems. U.S. drought disaster assistance to Mauritania has totaled more than $34 million since 1964. Emergency assistance has not been required to alleviate health crises in Mauritania in the past. However, increased urbanization, overcrowding, and unsanitary urban conditions may very well compound existing health problems and lead to the spread of disease not previously a problem due to low population density.

The following discussion identifies the general state of and prospects for increased Mauritanian food production and how drought has affected that sector. It further identifies the population's general health problems and points out how drought and the resulting exodus to urban areas has exacerbated those problems.

## Drought and Food Production

For most of the 1970s, Mauritania suffered from droughts, the worst occurring between 1972 and 1973. This drought has continued, to one degree or another, through 1979. During a year of "normal" rainfall, Mauritania harvests only half of its annual food needs, so even during the best of times, families lack enough collectively held food to last from harvest to harvest. Drought effects are severe, not only on the sedentary population, but also on Mauritania's large nomadic population.

Mauritania has the highest ratio of animals to farmers and herders of any African country. Livestock herding, chiefly by nomadic Maures, has been the traditional Mauritanian economy's dominant activity. Most cattle, sheep, and goats produced have been exported on the hoof, but since this is an unofficial activity, no government statistics are available to indicate the magnitude of the return. However, it is apparent that even without reliable statistics the drought seriously affected livestock by reducing pasturelands and water sources thus leading to the death, premature slaughter, or export of large numbers of livestock. Herd loss encouraged nomadic movement into the southern regions, especially urban areas such as Nouakchott. In fact, there has been a complete switch in the ratio of nomadic to settled populations during the last 10 years. Nomads, who constituted more than 65 percent of the population in 1965, constituted only about a third of the population in 1976[2]. This drastic change may be attributed to the Sahelian drought.

This changing demographic profile has profoundly affected all development sectors. Mauritania's urbanization has been described as one of the most rapid migrations in history. The causes of this flow to urban areas appear to be more than just the attraction of urban living and jobs, but are related to declining opportunities in the interior, government policies favoring modern sector investment, and urban food distribution.

However, there are certain peculiarities in the Mauritanian situation indicating this urbanization may not be an irreversible trend. For example, during the good rainfall years of 1974 and 1975, interior rural communities saw a return of their population. In addition, there is still not a large established population having only urban experience, and the prospective economic opportunities in urban centers are so limited as ultimately to force people to seek other alternatives.

The traditional or rural sector, located mostly in the sub-Saharan Sahel and to a lesser extent along the coast, has declined in economic importance. During the past five years it has maintained its share of GDP as an increase in livestock's contribution has offset agricultural and fishing declines. Livestock production represents the most important activity of the traditional economy, accounting not only for over three-fourths of this sector's GDP contribution, but also acting as the main income source for most nomads.

The agricultural area has grown little since independence, and there has been a decrease in productivity. Mauritania does not have enough rain to produce enough food for its people. Cereal production during the last five years has averaged less than 48,000 tons annually against an overall 180,000 ton need. The government must therefore rely on foreign donors for assistance in financing required grain imports.

Traditional agriculture--millet and sorghum cultivation--is practiced mainly on Senegal River flood plains. Small amounts of millet are also grown beyond this zone, depending on rainfall conditions, and seasonal crops are harvested around the wadis in the Saharan and Sahelian zones. Most millet is grown under primitive conditions without fertilizers or animal traction and is consumed by its producers.

Rice production and consumption is both a recent and significant agricultural development. Rice is increasingly preferred by urban Mauritanians. This changing food taste and the high urbanization rate have important implications for agricultural production.

Expanded agricultural activities during abundant rainfall years led to clearing land for farming, thereby straining limited soil and water resources. The Sahelian drought forced Mauritania to place greater emphasis on agricultural development, especially on the kind of controlled irrigation that could open new lands to agriculture and reduce dependence on unreliable rains.

Recurrent droughts have also had a disastrous effect on forest areas across the entire Sahelian zone. However, drought has only aggravated an already desperate situation since forest lands have long been used for firewood and construction materials or cleared for expanded agricultural activity. Deforestation around settled areas, where growing populations have exploited the forest, is especially severe. Brush fires further contribute to forest loss, and improperly stripping gum acacia trees significantly damages this important resource. Palm tree deterioration and loss have been attributed to not only the drought but also insect infestations and improper agricultural practices, such as irrigating with overly salty water.

Traditional or artisanal fishing is also an important Mauritanian economic activity and represents 10 percent of the rural sector's GDP contribution. The activity is carried out through traditional methods, although efforts are being made to modernize them. The Government of the Islamic Republic of Mauritania (GIRM) is trying to encourage and control maritime fishing, and recently extended its territorial waters to 200 miles offshore. These Atlantic fishing grounds are presently exploited chiefly by foreign vessels, particularly Japanese and Canadian. Nevertheless, considerable quantities of the catch are brought into Nouadhibou for processing in Mauritanian plants.

Mining is the economy's most important sector in terms of budget and export contributions, but it offers relatively few jobs. Mining focuses primarily on iron ore, gypsum, and, until 1978, copper.

Constraints which severely inhibit the government's ability to increase agricultural production and economic development include the lack of basic planning data; manpower; institutional capacity for extension; and animal and budgetary constraints. A later section will discuss some donor efforts to combat these problems.

## Health Care

Mauritania lacks reliable health statistics. However, those statistics that do exist indicate that apart from drought-caused and food shortage-induced malnutrition, the major causes of illness are malaria, respiratory, and parasitic diseases. Malnutrition affects 50 percent of all children in Mauritania. It is related not only to lack of food, but also poor weaning habits and interaction with other diseases.

Parasitic diseases of greatest importance are those water-related vector-borne diseases which produce diarrhea, malaria, hookworms, schistosomiasis, and guinea worm. Diarrhea is a major cause of death, particularly in children. It is related to contaminated water, lack of sanitation, malnutrition and other diseases. Malaria is the leading cause of death for 10 to 20 percent of newborns, and decreases adult productivity. It has been estimated that 70 percent of the population is infected. Hookworm is a leading cause of anemia but guinea worm is endemic only in small areas of Mauritania. Schistosomiasis causes very serious hepatic and renal problems in a small, but increasing percentage of the population as the Senegal River's water resources are developed.

Measles and pertussis are the major diseases that can be treated through immunization. It has been estimated that measles cause 10 to 20 percent of all child deaths. Pertussis primarily affects children and is an important cause of child mortality as well, interacting with malnutrition. Tuberculosis is also highly endemic[3].

Respiratory disease is probably the major cause of death among the nomadic population. It has been attributed to the nomad's exposure both to extreme temperature variations and air-suspended sand. However, the drought and consequent crowding of former nomads into tent cities on urban outskirts where health and sanitation facilities are at best inadequate has led to an increased incidence of all contagious and waterborne diseases. The increased occurrence of measles, which has taken place despite an expanded immunization program, may be attributed to the new population's exposure to the disease and the nomad's weakened resistence resulting from drought-related malnutrition. The drought has also led to a substantial increase in infant mortality. In some nomadic camps the average overall death rate has soared from 23 to 65 deaths per 1,000 population.

Mauritania has poor rural health coverage. In 1973 it was estimated that only 15 percent of the population was receiving medical attention[4]. Basic drugs are often lacking, especially in the rural areas, and there is a general lack of medically trained personnel, especially in reproductive health. Mauritania has no population control program, and is reportedly opposed to such efforts.

With external donor assistance, Mauritania has been strengthening efforts to improve its health care system to provide basic health care for large numbers of its population. Mobile teams are being created for prophylactic medicine and health education in rural areas. Health centers are also being established in regional capitals and secondary cities.

## DISASTER PREPAREDNESS IN MAURITANIA

Mauritania has an Emergency Planning Office responsible for coordinating external donor assistance. This office has reestablished the National Cereals Office which controls Mauritanian grain management and emergency food distribution. OFDA's country profile of Mauritania has more details on the country's present preparedness capacity. However, steps should be taken to determine how this Emergency Planning Office could be used as a focal point to consolidate and coordinate emergency preparedness measures.

# AID ASSISTANCE STRATEGY IN MAURITANIA

USAID/Nouakchott has chosen three areas for its limited assistance to Mauritania. They are environmental restoration, increased food production, and rural primary health care.

As part of its environmental restoration efforts, USAID/Nouakchott's ongoing Renewable Resources Management Project is using satellite imagery and aerial photography to survey the physical assets of the productive belt in the southern third of Mauritania. The project also provides sand dune stabilization at Mederdra and Boutilimit and experimental reforestation and range management activities. The Alternative Energy Project, under final PP review, addresses the increasingly crucial energy aspects of environmental degradation. The project will create an institution to make and extend small-scale technologically appropriate fuel-conserving devices to help meet rural population energy needs.

USAID/Nouakchott's efforts to increase food production include two area-specific agriculturally integrated projects, Guidimaka Integrated Rural Development and Oasis Development. Both cover innovative dryland crops, livestock and range management, and environmental restoration measures. They are supplemented by the Vegetable Production Project. This focuses on these overly neglected food sources in the Guidimaka and Assaba regions as well as along the Senegal River. An important project goal is to overcome serious malnutrition and vitamin deficiencies by increasing rural area vegetable consumption.

During the next two years these efforts will be augmented by four new projects. First, the Rural Land Reclamation Project will finance the Brakna Region construction or reconstruction of up to 12 rainwater runoff retention dams to supply water for recessional cereal crop cultivation. Also being designed is a P.L. 480 Title II Section 206 project (see P.L. 480 Title II section for a fuller description). This project will stimulate food production by stabilizing farm cereal prices at incentive-producing levels. The third project is the Rural Roads Improvement Project. AID and the United Nations' Sahelian Office will fund the upgrading of the M'Bout-Selilaby road to provide an all-weather link between the agriculturally rich Guidimaka region and improved roads leading to the Kiffa, Kaedi, and Nouakchott markets. The fourth is the Agricultural and Human Resources Development Project, proposed for FY82. One of the critical gaps in the GIRM's capacity to influence and aid the Mauritanian farmer is the lack of an effective system to extend research results to the farmer. In this project, the largest programmed for FY82, AID will help GIRM to strengthen its agricultural school and agronomic research center at Kaedi on the Senegal River. For FY83 USAID/Nouakchott proposes to consider turning future agriculture sector assistance

into an agricultural sector grant. This would give the Ministry of Rural Development an institutional building mechanism to make its extension service and supporting elements more effective in reaching farmers and herders as well as continuing environmental restoration.

Although livestock is very important in Mauritania, USAID/Nouakchott has decided to delay any major livestock intervention until the World Bank livestock project and other Dutch- and FED-financed efforts are underway. For now, AID's livestock subsector efforts are focused within the Guidimaka Integrated Rural Development and Oasis Development projects.

The third AID development priority area is rural primary health care. Through the Rural Medical Assistance Project, USAID/Nouakchott is helping GIRM take important first steps toward developing a Trarza Region model community-based rural health delivery system which minimizes recurrent costs through community support. USAID/Nouakchott is also combating malnutrition in its P.L. 480 program which is discussed in a later section.

USAID/Nouakchott also supports regional development programs in Mauritania including an immunization program, developing the Senegal River basin, land tenure, and family health programs. These will be discussed in chapter nine.

## P.L. 480 Title II Program

The projected FY83 P.L. 480 Title II program in Mauritania is $10 million. Catholic Relief Services administers the program which is expected to function as in previous years. It includes a maternal and child health component, nutritional rehabilitation, and adult health care. The program operates from 34 centers on a nationwide basis with the cooperation of the Mauritanian Ministry of Health. Due to the government's limited fiscal resources, CRS is responsible for managing the importation, storage, and inland transportation of commodities. Central warehouses are maintained at Nouakchott and Kaedi from which commodities are shipped as required to outlying distribution centers. Commodities include soy-fortified sorghum grits, non-fat dehydrated milk, and vegetable oil. The Title II program reaches nearly 78,000 recipients. Over 7300 mt of commodities will be distributed in Mauritania in FY83.

In FY83 USAID/Nouakchott is expected to approve a proposed Title II P.L. 480 Assistance Section 206 Grain Marketing Project which will integrate bilateral P.L. 480 assistance fully into the USAID/Nouakchott development program. The P.L. 480 emphasis is on nutrition, agricultural production, grain marketing, and its comprehensive food policy will complement current and proposed AID projects in the agriculture and health sectors. Over a three-year

period, the Mauritanian Cereals Office will sell 60,000 mt of P.L. 480 sorghum and wheat at gradually increasing prices, eventually eliminating the GIRM subsidy for distribution costs. At the same time, it will push the producer floor price to a level which can insure adequate compensation to the producer in a bumper crop year. These combined actions should increase the income of rural producers in real terms.

## PROJECT ANALYSIS

The following discussion identifies potential preparedness opportunities which may exist in conjunction with AID-, UNICEF-, UNDP-, and World Bank-financed development projects in Mauritania. Only national development projects are reviewed here. A description of regional projects affecting Mauritania can be found in chapter nine.

### Current Projects

Table V-1 lists ongoing and proposed AID-financed development projects in Mauritania. Of these projects, two indicate some potential for complementary preparedness activities. These activities include training and technical assistance.

The Rural Medical Assistance Project is designed to equip 192 rural community health workers in basic preventative and curative techniques. Present Ministry of Health (MOH) staff are instructed in the training and supervision of these community health workers in order to integrate this primary system with existing services. This is part of a larger GIRM strategy to improve the medical system inherited from the French. It has recently announced a liberalization of the health sector in an effort to address the lack of rural health services. The inherited system is predominantly urban hospital-based with few medical services reaching local communities, particularly in rural areas. The system's cost in personnel and maintenance accounts for over 95 percent of the total health budget. The system is curative and urban-oriented in its approach. The Rural Medical Assistance Project is intended to provide a model for extending low cost health care to the rural areas.

The project might offer an opportunity to design a low cost health emergency plan which could be extended to the rural areas and use this project as a vehicle for transmitting preparedness information. The information could be disseminated to community health workers in centers already used for training under this project.

Table V-1. Ongoing and Proposed AID-Funded Projects in Mauritania

| Project Name and Number 682-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY82 OBL ($US 000) | Project Cost FY83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Integrated Rural Development 0201 | To help GIRM increase food production by developing technically and socially sound methods for increasing crop and animal yields among sedentary inhabitants of Mauritania's Tenth Region and generate data required to launch an expanded extension program. | 79 | 82 | 1849 | -- | 6151 |
| Rural Medical Assistance 0202 | To train and equip rural community health workers in basic preventive and curative techniques to expand rural area services, personnel, and supplies. | 79 | 82 | -- | -- | 1662 |
| Rural Land Reclamation 0203 | To strengthen GIRM's ability to design and construct durable dams to increase cultivatable land for agricultural production. | 81 | 85 | 1714 | 2540 | 8900 |
| Vegetable Production 0204 | To determine the feasibility of expanded vegetable production among sedentary rural groups in regions 3, 5, and 6 through applied research and vegetable crop demonstration programs. | 78 | 82 | 900 | -- | 1470 |
| Renewable Resources Management 0205 (amendment) | To increase the capacity of the Protection of Nature Service (Ministry of Rural Development), responsible for environmental management, to plan and manage renewable resources. | 82 | 84 | 1000 | 2000 | 5997 |
| Oases Development 0207 | To introduce technologies in agricultural production and water resources utilization to help oases residents become more self-sufficient in food production and provide an information base for future expanded oases development. | 80 | 84 | 700 | 1000 | 5991 |
| Rural Roads Improvement 0214 | Upgrade secondary feeder roads to become all-weather road link between agriculturally rich regions and farm-to-market roads. | 82 | 85 | 1200 | 1500 | 6500 |
| Alternative Energy 0223 | To improve GIRM's capacity to create and extend small-scale technologically appropriate fuel-conserving devices to help meet the energy needs of the rural population through institution building. | 82 | 86 | 1337 | 960 | 4836 |

| Project Name and Number 682-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY82 OBL ($US 000) | Project Cost FY83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Agricultural and Human Resources Development 0224 | To influence and assist farmers by extending research results accompanied by improved extension services. To strengthen the agricultural school and agronomic research center. | 82 | 86 | 1000 | 1000 | 17,000 |
| Small Perimeters (OPG) Africare 0226 | To develop and strengthen the SONADER services in the Gouranye Sector by extending the techniques and methods of irrigated agriculture and guidance to farmers; and establish and support farmer participation through cooperatives. | 81 | 82 | -- | -- | 500 |
| Agricultural Sector Grant 0229 | To strengthen the Ministry of Rural Development's capacity to design and implement projects to stimulate agricultural production in the rural sector. | 83 | 87 | -- | 1000 | 10,000 |

Another preparedness opportunity exists in conjunction with, but not directly supportive of, rural project activities. WHO has a Regional Training Center for health service personnel in Lome. Discussions might be initiated with WHO to determine the feasibility of introducing an emergency preparedness seminar within the training center's curriculum. Public health nurses working under this project will receive training at this center.

Another interesting, but as-yet-undeveloped project component is radio use. Using radios in rural health programs is widespread and has been done elsewhere in many ways. Eventually there may be public broadcasts in health education, particularly for Mauritania's rural communities. However, there is also a small-scale use for simple point-to-point short-wave radio communications. A CB-type system has been proposed for inclusion in this project. Radio communication would be established on a pilot basis with small handsets issued to individual community health workers during their training along with operational instructions. The system's major objectives would be to:

- Make possible emergency communications in cases where timely care is required at a higher level than immediately available from a community health worker;
- Serve as prompt communications channels for referrals; and
- Ascertain the availability of medical supplies from licensed agents.

Radios have already been budgeted into the project, but no decision to try them has yet been made. This is one area where health emergency preparedness needs could be served. An investigation into determining radio feasibility for transmitting other kinds of health related information could also be made.

A second project presenting potential preparedness opportunities is the Renewable Resources Management Project. Its goals are to promote rural sector development by establishing comprehensive programs to build a trained manpower base and develop resources required to withstand adverse climate and environmental conditions.

This project will implement a renewable resources survey to establish baseline data for a national renewable resources plan as well as provide data to apply to implementing discrete project activities. A series of experimental pilot interventions will test the feasibility of specific approaches for resource conservation and renewal. A third component will provide long-term training for Mauritanians in general resource management--one in arid lands resource management, one in forest resources management, and four in extension and resource personnel management and

development. In addition, short-term training in extension methods for up to 40 Mauritanians will be provided along with short-term training for up to nine LANDSAT photo-interpreters. These photo-interpreters will be receiving on-the-job training and thorough retraining courses.

This training component provides the opportunity to conduct a U.S. preparedness seminar geared toward monitoring Sahelian environmental disasters and taking advantage of these students' presence in the United States. The short-term training component, which includes teaching Mauritanian personnel how to interpret satellite imagery and aerial photographs and do ground truth surveys, might also be used for preparedness purposes. Since these personnel are already familiar with this type of technology and what it can do, they might be ideal candidates for further training in the weather/crop yields forecasting system. Table V-2 lists these projects, their AID-financed components, and associated preparedness needs.

Proposed Projects

AID has very little available information about the specific composition of either the proposed Agricultural Sector Grant or the Agricutural and Human Resource Development projects. However, of those projects to start in FY82 and FY83, these offer the most potential for preparedness activities. Both involve the Ministry of Rural Development and extension activities as well as institution-building components. Discussions could be held with USAID/Nouakchott to determine the appropriateness of further interventions in the design stage at this time.

Other Donor-Assisted Projects

UNDRO has not initiated preparedness or relief activities in Mauritania from April 1977 to July 1981. The World Bank, UNICEF, and UNDP have modest investments in the country. More details of these programs will be explained in the following discussion.

UNICEF

Primary health care and a strengthened network of maternal child health centers will be one of UNICEF's Mauritanian program priorities beginning in 1982. In addition to the current training program for traditional birth attendants, training programs for village health workers will be initiated. UNICEF will promote health, educational, and environmental improvement, and

Table V-2. Selected AID-Supported Projects in Mauritania and Their Associated Preparedness Needs

| Project Name and Number 682-- | Primary AID-Supported Components | Potential Preparedness Activity |
|---|---|---|
| Rural Medical Assistance 0202 | Technical Assistance<br>Long- and short-term.<br>Training<br>In-country and in Lome at the WHO Regional Training Center.<br>Equipment and Supplies | Design a low-cost health emergency plan which could be extended to rural areas and use this project as vehicle for transmitting information.<br><br>Introduce health emergency preparedness into curriculum of WHO Regional Training Center in Lome.<br><br>Investigate possibility of using CB radio system to disseminate emergency preparedness information. |
| Renewable Resources Management 0205 | Technical Assistance<br>Long- and short-term.<br>Training<br>Long-term in the U.S., Morroco, and Senegal; Short-term and on-the-job.<br>Equipment and Commodities | Training<br>U.S.-based preparedness seminar geared toward monitoring environmental disasters to take advantage of Mauritanian students studying resource and arid lands resource management in the United States.<br><br>Mauritania- or U.S.-based, whichever most appropriate, to build upon LANDSAT photo-imagery training provided by the project by introducing weather/crop yield model framework for evaluating creeping disasters. |

infrastructure building measures in irrigated areas on the Senegal River in conjunction with major agricultural development projects. A significant part of UNICEF's efforts will help integrate health education into the basic education curriculum. This will also require retraining teachers and producing teaching materials. Table V-3 illustrates the recommended 1981-84 Mauritanian assistance program broken down by field of assistance.

UNICEF will also continue supporting the Rosso Satara Development Project begun in 1977. This will enable the nomadic population, driven from the desert by drought and recently settled into the shantytown of Rosso Satara, to improve their living and housing conditions with their own home-building operations.

The health development plan UNICEF is supporting includes:

- Establishing a MCH center whose activities will extend to the whole area;
- Improving the population's nutritional situation by stimulating, utilizing, diversifying, and processing or preserving local agricultural produce;
- Supplying the population with drinking water, and building latrines;
- Providing environmental sanitation and rainwater drainage; and
- Systematizing and rationalizing primary health care in the shantytown and villages under consideration.

UNICEF will also teach artisans how to construct clay ovens with low fuel consumption in order to produce home construction building materials. The plan also envisages operating cooperatives to produce clothing.

In addition, UNICEF will support appropriately adapted literacy operations, agricultural extension, and help integrate nutrition and health education into elementary school instruction of agricultural practices. UNICEF is also cooperating with UNESCO and UNDP in the National Pedagogical Institute's effort to produce audio-visual material for teacher training and retraining.

World Bank

The World Bank has over $17.5 million in ongoing Mauritanian projects (Table V-4). There is also a relatively heavy investment in developing the port facilities at Nouadhibou and urban and

Table V-3. Projected UNICEF Program of Coooperation in Mauritania

1981-84

| Commitments and Notings | 1981 | 1982 | 1983 | 1984 | Total |
|---|---|---|---|---|---|
| | Probable Yearly Call-Forwards | | | | |
| | ($US 000) | | | | |
| Breakdown by Assistance Areas | | | | | |
| Child Health | 441 | 424 | 300 | 280 | 1,445 |
| Water Supply | 100 | 90 | 350 | 300 | 840 |
| Child Nutrition | 170 | 174 | 250 | 150 | 744 |
| Formal Education | 110 | 120 | 140 | 130 | 500 |
| Informal Education | 120 | 143 | 200 | 140 | 603 |
| (Urban Areas Programs: figures broken down under preceeding headings). | (300) | (400) | (500) | (200) | (1,400) |

Source: UNICEF Country Programmem Profile, Mauritania. May 8, 1981, E/ICEF/P/L. 2070 (REC).

Table V-4. Current World Bank Financed Projects in Mauritania[a]

| Project Name | Credit Number | Effective Date | Closing Date | Original Principal ($US million) |
|---|---|---|---|---|
| Education | 459-0 | November 1974 | December 1983 | 3.8 |
| Third Highway | 519-0 | June 1976 | December 1981 | 3.0 |
| Technical Assistance | 665-0 | April 1977 | June 1982 | 2.7 |
| Urban and Rural Development | 898-0 | October 1979 | December 1983 | 8.0 |
| Total Value of Current Projects | | | | 17.5 |

[a]Closing date of the loan after November 1981.

Source: International Development Association, Statement of Development Credits, August 31, 1981.

rural development. Most World Bank projects do not offer any immediately discernable opportunities for emergency preparedness activities. See Table V-5 for a description of proposed World Bank-financed projects in Mauritania.

UNDP

Very little information was available from UNDP on its Mauritanian program. Five project documents were made available, however, focusing on agricultural extension and training, applied irrigated agricultural research, agro-meteorological and hydrological services, water resource planning, and fisheries development. Table V-6 gives a brief description and pertinent details on these projects. UNDP assistance to the National School for Agricultural Training and Extension may offer some potential for introducing emergency preparedness training.

## CONCLUSIONS

The following recommendations suggest potential emergency preparedness activities to be taken in conjunction with ongoing and proposed donor-financed development projects in Mauritania:

- Conduct a U.S.-based seminar geared toward monitoring environmental disasters such as experienced in the Sahel, to take advantage of the presence of Mauritanian students studying arid land resource management in the United States under the Renewable Resources Management Project.

- Build upon the training provided by the Renewable Resources Management Project in photo-interpretation of LANDSAT imagery by introducing training designed to acquaint Mauritanian technicians with the weather/crop yield model framework for forecasting creeping disasters.

- Initiate discussions with the Ministry of Health to design a low-cost health emergency plan which could be extended to rural areas using the Rural Medical Assistance Project as a vehicle.

- Initiate discussions with WHO to introduce health emergency preparedness into the curriculum of the WHO Regional Training Center at Lome.

- Investigate the possibility of using a CB radio system to disseminate emergency preparedness information under the Rural Medical Assistance Project.

Table V-5. Proposed World Bank Financed Projects In Mauritania

| Project Name | Government Agency | Description | ($US Millions) Total IDA Commitment | Status |
|---|---|---|---|---|
| Fourth Highway Project | Ministere de l'Equipement | Road maintenance study, pre-investment studies for pavement strengthening, completion of unpaved roads started under Third Highway project. | 3.5[a] | Negotiations tentatively scheduled for July/August. |
| Petroleum Exploration Promotion Project | Ministry of Energy and Mines | n.a. | 2.9 | Negotiations scheduled for June. |
| Education II | Ministere de l'Education Nationale, Ministere de l'Emlpoi et de l'Formation de Cadres, Ministere de la Peche et de l'Economie Maritime. | Strengthening educational planning and administration, training lower secondary school teachers, and vocational training for the fisheries and industrial sectors. | 5.4[b] | Appraisal report being prepared. |
| Technical Assistance to the Rural Sector | n.a. | n.a. | 2.0 | Appraisal scheduled for June. |
| Second Technical Assistance Project for Planning | Ministry of Economy and Finance. | n.a. | 2.9 | Appraisal scheduled for June. |

Source: World Bank Monthly Operational Summary, June 1981, Johns Hopkins University Press, 1981.

[a] Kuwait Fund is financing $5.1 million and Arab Fund for Economic Development, $4.4 million.
[b] Co-financing with AKDB and EEC envisaged.



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Table V-6. Selected UNDP Projects in Mauritania

| Project Name | Description | Executing Agency | Period of Assistance | Total UNDP Contribution ($US 000) |
|---|---|---|---|---|
| Applied Irrigated Rice Research | To develop climate resistent rice varieties, improve fertilization, irrigation and protection of vegetation methods. | FAO | 1978-1983 | 198.8 |
| Assistance to the National School for Agricultural Training and Extension Phase III | To reinforce structures at the school, improve personnel training, train new professors, and adapt curriculum to local conditions. | FAO | 1978-1981 | 842.2 |
| Water Resource Planning and Use | Rational planning of hydraulic equipment, make the Bureau of Inventory and Direction of Hydrology operational, identify projects. | United Nations | 1977-1981 | 331.4 |
| Agro-meteorological and Hydrological Project | To assure continuity of regional activities and improve and strengthen the agro-meteorlogical and hydrological services. | WMO | 1978-1981 | 293.4 |
| Artisanal Maritime Fisheries Development | Improve technical capacity of the Direction of Fisheries to create centers of commerialization for the sale of fish and fish by-products and improve the techniques of artisanal fishermen. | FAO | 1981-1985 | 1,462 |

Source: Internal UNDP documents and UNDP Area officer for Mauritania.

- Initiate discussions with USAID/Nouakchott to determine the appropriateness of emergency preparedness activities when designing the Agricultural and Human Resource Development Project and the Agricultural Sector Grant, both scheduled to be designed in FY82.

- Initiate discussions with UNDP representatives in Nouakchott to determine the appropriateness of introducing emergency preparedness into the curriculum of the National School for Agricultural Training and Extension Project.

# NOTES TO CHAPTER FIVE

## MAURITANIA

[1] Library of Congress, Draft Environmental Report on Mauritania, January 1979, p. 10.

[2] Ibid, p. 2.

[3] UNICEF, Country Program Profile, Mauritania, May 1981, E/ICEF/P.L.2070(REC).

[4] Draft Environmental Report, p. 4.

# CHAPTER SIX

## NIGER

Niger is one of Africa's largest landlocked countries. It covers 1.3 million sq km between latitudes 10° and 25°. Rainfall decreases from between 700 and 800 mm annually in the south to less than 350 mm in the north. More than 75 percent of the country is desert, 15 percent semi-arid, and less than 10 percent suitable for crop production, but of very low potential. Only about 2 percent of the land is cultivated[1].

Niger has about five million people, over four million in rural areas. The population is comprised of sedentary farmers and a mix of nomadic and semi-sedentary herders. About three-quarters of the population lives in a narrow bank between the southern border and the 500 mm isohyet where population pressure averages only about 20 per sq km, although it may be as high as 100 per sq km in the valleys. The population growth rate is a high 2.7 percent annually.

Drought is a common occurrence and compounds the progressive deterioration of an ecological system subject to natural and man-made forces throughout the past several centuries. The 1968-74 period of below-normal rainfall was an extremely significant and catastrophic event in Niger's modern history. It served to mark both the population and government with the need to restore the former ecological balance as the underlying priority sustaining all rehabilitation and development.

## DISASTERS IN NIGER

Niger has been stricken with droughts, epidemics, and localized flooding that required international emergency relief during eight of the past 15 years. While drought is undoubtedly the most serious natural disaster and has led to the deaths of tens of thousands of people, the country also has serious health problems producing epidemics of meningitis and yellow fever which periodically sweep the country. In addition, Niger has experienced flash flooding as a result of torrential rains which damage property and leave thousands homeless. U.S. relief to Niger between 1969 and 1974 totaled over $21 million[2].

### Drought and Food Production

As in other Sahelian states, drought is the leading cause of human suffering that requires international emergency assistance. The nature of environmental deterioration and food production are inextricably linked and directly affect any drought preparedness strategy.

Agriculture is the primary source of income for 85 to 90 percent of Nigeriens. Only about 30 million ha are agriculturally viable, while six million ha are currently under cultivation[3]. Most of Niger has a desert climate and is unsuitable for agriculture. The harsh climate with an annual rainfall below 350 mm and high temperatures, rapid evaporation, shallow soil, steep slopes, and excessive erosion, or shifting sands all contribute to poor agricultural prospects. Most farming takes place in a band crossing the country which receives 350 to 650 mm of annual rainfall.

Recognizing the drought hazard and increasing conflict between sedentary farmers and nomads seeking pasture, the government established a northern crop production limit in 1954, revised in 1961 due to cultivators' northward pressure. Recently, population pressure has pushed cultivation past the 300 mm limit. In some places the concept is ignored.

Before 1972 Niger was self-sufficient in basic foodstuffs during normal rainfall years. During 1973-75, the three most severe drought years, food imports averaged half of marketed production. Before the drought, agricultural production provided most of Niger's export earnings. However, the area devoted to millet and sorghum cultivation has steadily increased at the expense of export crops and presently accounts for 75 percent of all cultivated land[4]. Despite good harvests in 1976-77, 1978-79, and 1979-80, the government has maintained its interest in increasing emphasis on cereals production. Emergency food imports have only amounted to 2 percent of total food requirements in recent years[5].

Niger has, more than any other Sahelian country, concentrated on expanding food grain storage facilities. Some 80,000 tons of new capacity have been constructed since 1974. Nevertheless, the national cereals office (OPAM) has been able to procure only a portion of the grain for which storage capacity exists. This is largely due to the reconstitution of on-farm storage stocks after their complete drought-period depletion, and a parallel market price for grain which has generally remained higher than the official OPAM price.

Donors view Niger as having become self-sufficient in food during the 1980-81 crop year. There are several factors accounting for Niger's exceptional food production during the past several years which have led to essential self-sufficiency in basic foods. These include: high producer prices, usually higher than the official price due largely to demand from Nigeria; expanding the area of food crop production (probably a response to high food crop prices); a high subsidy level for production inputs, tools, and implements; and externally-supported productivity projects covering most good agricultural lands. However, recent projections suggest there will be an important millet and sorghum deficit in coming years. The Government of

Niger (GON) recognizes that a period of drought or serious pest invasion would create renewed dependency on donor-provided food assistance. Therefore, it has placed an emphasis on maintaining a cereals reserve stock at a level to carry the country through a food shortage period although this stock is yet to be fully established. Provided rainfed farming productivity projects are implemented as envisaged, Niger will continue to be nearly self-sufficient in cereals. Productivity will continue to be vulnerable to the vagaries of climate, but one source has estimated that the probability of a drought as severe as in 1973 is very low(.02)[6].

The rural sector contribution to the GNP has steadily declined relative to mining and manufacturing sector increases. While drought substantially reduced crop production and decimated livestock herds, uranium mining emerged as a crucial and integral part of Nigerien economic growth after 1972.

Apart from uranium, the country's natural resources are unusually poor. The climate imposes a severe limit on the area where cultivation is possible. Even in such areas, uncertain rainfall makes farming a hazardous occupation. Soils are generally poor. In many areas, fertility is declining as fallow periods are being shortened.

The government has responded to these challenges by selecting a dual development objective in the agricultural sector to exploit the potential in rainfed crops and livestock production; expand the use of animal traction and production inputs such as fertilizer and improved seeds; more closely integrate small farm animal and crop production; and increase the area under controlled irrigation. Water, though abundant underground, is found in only a few valleys, and irrigation is costly (over $10,000 per ha). The government's approach has proven to be reasonable since it appears cereals production technology is adequate to produce incremental food requirements.

The government's main objectives for the livestock subsector are to: reconstitute herds and flocks; increase animal productivity to generate exports at the pre-drought volume; manage the semi-arid pastoral zone to preserve the ecological balance; and more closely integrate animal and crop production. Livestock raising accounts for about 10 percent of GNP (some figures report as high as 18 percent) and, until the drought, was 20 percent increasing 3 percent each year[7]. However, from 1970-74 the herds were decimated. Livestock numbers have risen again, but denial of access to traditional migration corridors and shrinking range land present increasing constraints.

Like other Sahelian states, Niger suffers from the same problems of inadequate infrastructure, roads, transport, and trained manpower. Niger also has a serious desertification problem in some areas. The Niger Agricultural Sector Assessment cites four contributing factors:

- Overgrazing during the 1973-75 drought;
- Cutting trees for fuel and wood with no replacement program;
- Cultivating marginal lands due to population pressures and the need for food crops; and
- Inadequate response to drought. There was no place for villagers to go in the better rainfall areas so they mostly stayed in their villages, putting added pressure on the already scanty vegetation and water resources.

Like other Sahelian states, the drought and, in Niger's case, change of government provided a catalyst for changing several development policies and strategies.

## Epidemics and Health Care

The principal diseases affecting Niger's population include malaria, bilharzia, cerebrospinal meningitis, measles, tuberculosis, trachoma, and leprosy. The primary causes of infant mortality are digestive infections, malaria, nutritional inadequacies, respiratory infections, and measles. There is a measles immunization program, but coverage is limited.

Programs also exist to combat leprosy, tuberculosis, and onchocerciasis, but their effectiveness varies. Diffused concentrations of schistosomiasis exist throughout the country, and onchocerciasis outbreaks are common in the east and along the Niger River. There have also been recent outbreaks of cholera and poliomyelitis. Malaria and meningitis outbreaks occur during the August-to-December wet seasons for malaria, and the November-to-June the dry seasons for meningitis.

Despite the government's great efforts to develop social health services--health, education, training, drinking water supply, and environmental sanitation--since independence, the population's living standard is still precarious. Barely 20 percent have access to health services. The mortality rate is very high among children (200 deaths per 1,000 for children under one year of age, and 300 per 1,000 for those between the ages of one and five)[8].

Malnutrition, aggravated by mothers' ignorance of dietary requirements, is the major health problem young children face, especially among the nomadic population. It was not until 1974 that the government established a National Health and Sanitation Service. This service still has only rudimentary resources as far as personnel and supplies are concerned. It has been estimated that only one-third of urban dwellers have individual facilities for refuse disposal compared to 3 percent for rural inhabitants.

In 1960, Niger resembled other landlocked Sahelian countries with its demographic/disease patterns and lack of effective infrastructure and health sector resources. In 1964, the GON prepared a 10-year program identifying three development health sector priorities. They included: medicine de masse, or public health, stressing preventive and simple curative services for the rural population; health education, particularly regarding maternal and child health, nutrition, and village hygiene; and training Nigerien health workers. Significantly, and unlike other Sahelian countries, a much lower priority was placed on further developing urban area hospital-based services.

With the change of government in 1974, the new administration continued to develop rural public health services by using village health workers. While major constraints remain the same as in 1964, the lack of trained personnel and financial resources continue to overshadow other important technical constraints such as logistics, and technical considerations regarding the health workers' training and supervision. Despite some continuing problems, however, the GON's basic policy and strategy is perhaps the only feasible one for providing and expanding basic health services to a far-flung rural population. In one source's opinion, Niger presents the best opportunity in the West African health sector for AID to demonstrate its willingness to help implement an indigenous government's own health strategy.

An important difference between Niger's situation and that in other Sahelian countries is that the GON has already carried out the underlying policy and administrative reform necessary to effectively develop village-based rural health services. However, there are still several constraints to health sector development that are related to emergency preparedness.

The vast land area of Niger, its scattered village and nomadic population, difficult desert terrain and climate, and the poorly developed communication and transport systems pose severe obstacles to developing and maintaining a rural health delivery system. Personnel can become isolated from technical and motivational support; vehicles have an extremely short useful life; and logistic support and supply channels are difficult to create and sustain. During the rainy season, village access routes are often impassable. Given these constraints, the GON policy of placing emphases on simple health activities that village health workers can carry out by themselves would seem to be the most appropriate and feasible response.

While there are severe manpower constraints at all Ministry of Health (MOH) levels, there are additional factors at the operational level which seem to represent health system strengths. One is the degree of decentralization and local authority at the departmental level in such areas as village health workers, training curricula, service delivery, priorities, and so forth. Another strength is the MOH's willingness to be self-evaluative and self-critical.

During the drought period, Niger's total public expenditures declined in real terms. But the FY75 increases in uranium revenue and other taxes due to post-drought economic recovery increased total current revenues by almost 50 percent.

During the five-year 1973-77 period, the MOH health budget increased 85 percent--from 1.018 billion CFA to 1.882 billion CFA--but remained a stable 8 percent of total current government expenditures. The MOH budget breakdown into personnel versus material and operating costs shows that personnel has taken about half of the budget during the 1973-77 period. The most recent figure was 46 percent[9]. This compares with 86 percent in Upper Volta. Senegal also has a higher budget proportion devoted to personnel costs. With only half its health budget going to personnel, Niger's MOH has more flexibility than some other Sahelian countries.

## DISASTER PREPAREDNESS IN NIGER

Niger suffers from the same basic constraints in dealing with its environmental and man-made hazards as do other Sahelian states. It has been extremely drought-prone in the past, but has not required emergency assistance for any type of disaster since 1975. OFDA's country profile describes Ministry of Rural Development (MRD) responsibilities as monitoring environmental conditions, coordinating external aid, and coordinating internal distribution and food shortage problems.

Niger lacks a national disaster plan and is only beginning to plan reserve stocks for deficit year use. There may be a sense among MRD officials that a drought the magnitude of that in 1969-75 will not recur. Currently favorable economic and food production conditions will not last forever, and the need for preparedness, especially now, should receive more attention. The following discussion will examine ways in which preparedness could be integrated within ongoing and proposed Nigerien development efforts.

### Aid's-Assistance in Niger

AID's proposed FY82 Nigerien assistance was nearly $15.4 million, while proposed FY83 assistance planning levels total nearly $26.3 million. Within the Sahel Development Program, Niger is one country program which has survived recent budgetary cuts and seems to be expanding. This is due to several economic and political factors, including Niger's cooperation with the United States in international forums, (increasingly important since its 1980 election to the Security Council); the discovery of uranium

resources; and continued economic progress based on sound management of its own and foreign assistance. Niger's strategy of funneling uranium revenues into rural sector development to strengthen the agriculturally-based economy and sustain the country after uranium deposits are exhausted, has helped Niger emerge as something of a symbol to other Sahelian states.

AID's strategy over the next five years will continue to focus on national-level institutions to support local-level service delivery. The emphasis is on five basic areas: rainfed agricultural, livestock and range management; human resource development; rural health; and the ecology. AID's program consists of six "CORE" projects in the five areas mentioned above: Agriculture Production Support and Cereals Research; Niamey Department Development; Range and Livestock; Rural Sector Human Resources Development and Sahel Manpower Development (the latter a regional project discussed in chapter nine); Rural Health Improvement; and Forestry and Land Use Planning. These projects are assisted by several "SUPPORT" projects. (Table VI-1). AID's strategy is targeted at constraints identified in key development sectors. It avoids areas where other donor activity is judged sufficient (such as grain storage) and concentrates on related and mutually reinforcing projects.

AID's strategy concerning food production focuses on three major constraints in the agricultural sector: decreasing soil fertility; lack of trained manpower; and weak infrastructural systems for delivering agricultural inputs and technologies. Almost all projects in the present and planned AID project portfolio address one or more of these constraints.

AID livestock sector strategy during the 1983-97 period will be to help the GON develop initiatives to organize and educate herders to implement range management techniques, stress protecting and enhancing range lands, and improve livestock reproduction and marketing mechanisms. The range and livestock project is expected to generate much data essential to determining the most appropriate and effective methods for accomplishing these objectives.

In the health sector, AID and other donors support the national-level Rural Health Improvement Project under the Ministry of Health and Social Affairs. It is the GON vehicle for implementing the health system and expanding the system's geographic and human coverage. AID will emphasize management planning and administration, training and retraining, along with technical assistance for strengthening the institutional support system.

Training is an important and integral part of each AID project. Niger's AID program training ranges from long-term academic and third-country training for management and technical

Table VI-1. Selected Ongoing and Proposed AID-Supported Projects in Niger

| Project Title and Number 683-- | Description | Fiscal Year of Initial Funding | Project Completion Year | Project Cost FY82 OBL | Project Cost FY83 AAPL ($000) | Project Cost Total LOP AUTH |
|---|---|---|---|---|---|---|
| Rural Health Improvement 0208 | To establish a viable rural health system which demonstrates the value of prevention, early diagnosis, timely curative intervention, and proper referral activities through human resource development and institutional support. | 78 | 83 | -- | 1,000 | 12,000 |
| Niger Cereals Research 0225 | To improve INRAN's capability to identify and test improved cereal production practices and cereal varieties which are appropriate and area specific for the major Nigerien crop zones. | 82 | 85 | 3,615 | 2,554 | 7,000 |
| Rural Sector Human Resources Development | To help the MRD produce competently trained mid-level rural development agents who will direct MRD field activities. | 79 | 83 | 1,185 | -- | 5,030 |
| Evaluation Assistance 0229 | To establish a functioning evaluation support unit in the Ministry of Planning, as well as, effective linkages and information exchanges with technical ministries. | 81 | 82 | 1,4000 | -- | 2,000 |
| Niger Forestry and Land-Use Planning 0230 | To help Niger attain food self-sufficiency and sustained growth in rural areas through long-term efforts to slow down, arrest and reverse the existing trends of deterioration in Niger's natural resources of soil and vegetative cover. | 80 | 83 | -- | 1,200 | 3,839 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Agriculture Sector Production Support 0234 | To help the GON Agricultural Service and UNCC increase and improve cereal production practices and cereal varieties which are appropriate and area specific for the major Nigerien crop zones. | 82 | 86 | 4,700 | 4,400 | 20,480 |
| Literacy Training 0237 | To institutionalize an effec- Nigerian-staffed literacy center to provide critical training and research support for adult literacy programs actively integrated into the implementation of Niger's rural development projects. | 81 | 83 | -- | -- | 1,810 |
| Niamey Department Development Phase II 0240 | To institutionalize process development through establishing of self-managed village organizations capable of helping farm families achieve increased food production on a self-sustaining basis. | 81 | 85 | -- | 3,000 | 13,582 |
| Pastoral and Range Development Livestock II 0242 | To develop a range management system in the pastoral zone preserve and improve range resources, and increase the income and well-being of herders living within the zone. | 82 | 86 | 750 | 1,246 | 15,000 |
| CDARMA | To improve agricultural production methods by establishing facilities to manufacture farm implements and tools and train rural artisans in maintenance and repair. | 82 | 83 | 2,000 | 1,000 | 3,000 |
| Tapi Vert (OPG) Phase II 0244 | To undertake an applied research program and experiment with local participation at the village level to address desertification and resultant low agricultural productivity. | 82 | 84 | 300 | 350 | 900 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tara II (OPG) Irrigated Agricultural Development II 0245 | To increase farmers' productive capacity in Niger's Tara region through an integrated approach combining broad-based village-level management with intensive irrigated agriculture. | 82 | 84 | 250 | 250 | 1,100 |

Sources: FY82 Congressional Presentation; Annual Budget Submission FY83, Niger; Project Papers and Project Identification Documents.

NOTE: Does not include regional Sahel Development Program Projects. A listing and description of those projects can be found in Chapter Nine.

personnel to local training for farm family husband-and-wife teams in improved agricultural techniques. Short-term organizational and technical training is also provided for cooperative managers and members.

AID continues to support and encourage the rural development initiatives of U.S. private voluntary organizations (PVOs) in Niger. There are not many U.S. PVOs in Niger (Africare, CARE, Church World Service, Catholic Relief Service), and their programs are not large. However, there is a need for the village-level community development activities in which these organizations are involved.

P.L. 480 Program

The proposed U.S. contribution to Niger's reserve stock program is up to 18,000 mt of P.L. 480 grain through the World Food Program (WFP) from 1981-84. WFP may also request up to 10,000 tons of Title II sorghum and possibly vegetable oil for a rural development project that includes price stabilization, food for work, and food for training components. These endorsements have not yet been granted pending further project development[11].

Beyond WFP possibilities, USAID/Niamey does not anticipate a P.L. 480 food requirement for Niger during the present planning period.

The following section discusses current and proposed projects in Niger along with their application to emergency preparedness.

## PROJECT ANALYSIS

This project analysis will review AID-supported projects and selected World Bank-, UNDP-, UNICEF-, and UNDRO-supported activities in Niger. Its purpose is to discover potential opportunities for increasing Nigerien emergency preparedness through donor-financed development projects. This section's information sources include the Niger CDSS, project papers, project identification documents, health and agricultural sector assessments, World Bank appraisal documents, UNDRO, UNICEF, and UNDP country profiles, and reports to the United Nations.

## AID-Supported Projects

Table VI-1 provides a selected list of ongoing and proposed AID-supported projects in Niger. A sample was reviewed for its relevance to past disaster hazards, namely drought, epidemic and floods; as well as project continuation into FY82 and beyond. The emergency preparedness opportunities suggested in table VI-2 were identified with reference to hazard/vulnerability analysis, resource analysis, organizational development, training and early warning systems.

## Current Projects

Ongoing AID-supported projects which present preparedness opportunities fall into two categories: training and orientation, and technical assistance.

### Training and Orientation

Three projects present opportunities for different levels of training and orientation seminars and meetings. They include:

- Rural Health Improvement: Biannual department-level seminars are held for MOH officers to discuss planning and management issues. Discussions could be initiated with DDS officials, who exert local control over seminar content, to incorporate emergency management as a discussion item. This might involve technical assistance to implement this recommendation or simply involve persuading MOH and DDS officals of this subject's importance and the need to incorporate it with project-supported seminars.

- Rural Sector Human Resources Development: Study tour participants are scheduled to come to the United States and other African countries in FY82 and FY83 to become familiar with rural development and field work. This project is also sponsoring Nigerien graduate students in the United States to study rural sociology, economics, and other areas. OFDA might take advantage of their presence and that of GON officals in the United States by scheduling an orientation meeting or seminar on emergency preparedness tailored for the Sahelian situation. This is an opportunity which might be planned within the larger context of Sahelian training in the United States. See chapters nine and 11 for a further discussion.

- Evaluation Assistance This project presents at least three different types of training opportunities. First, this project sponsors Nigerien graduate students studying

| | | |
|---|---|---|
| Literacy Training<br>0237 | Technical Assistance<br>Planner/evaluator to teach courses in education planning, literacy evaluation methodology, and so on.<br>Training<br>U.S. participant training for graduate-level education in non-formal education.<br>Commodities<br>Construction | There is now only marginal potential for preparedness activity in this project. |
| Niamey Department Development Phase II<br>0240 | Construction<br>Commodities and Equipment<br>Technical Assistance<br>Short- and Long-term.<br>Training<br>Short-term third country and incountry cooperative agent training. | This is essentially a technical services delivery project supporting village-level organizational development. Preparedness possibilities are currently marginal to project goals. |
| Pastoral and Range Development Livestock II<br>0242 | | |

a Excluding capital intensive projects such as roads, catchments, warehouses, docks, forestation, and so forth.

Sources: Project papers and project identification documents.

public management in the United States. A short seminar or emergency management techniques could be held taking advantage of their presence in the United States. Second, the project is also sponsoring several project staffers' attendance at World Bank-sponsored Economic Development Institute (EDI) courses. Preliminary discussions might be held to develop a joint seminar on emergency management or other related topics with EDI staff.

A third training opportunity might exist in Niger with the staff of the Ministry of Planning's newly created Evaluation Bureau. Since this project concerns evaluation, the subject of the need for and methodological difficulties evaluating emergency operations could be discussed. This would help develop an awareness that a Nigerien national disaster plan, now lacking, is in fact needed. This plan could also provide a framework under which future emergency operations could be conducted, evaluated, and ultimately improved.

## Technical Assistance

The one AID-supported project which may offer some potential for preparedness technical assistance concerns the Evaluation Assistance Project. Niger has no disaster plan and the responsibility for managing emergency operations rests with the Ministry of Rural Development. However, the Ministry of Planning is responsible for sectoral planning and its newly created Evaluation Bureau is receiving assistance from several donors. If the idea of a seminar to introduce emergency operations evaluation concepts is not feasible, short-term technical assistance to train designated MOP staff in evaluation techniques that assess performance during emergency assistance operations might be another alternative worth pursuing. Actually, technical assistance is probably not feasible without first introducing the MOP to emergency operations evaluations. MOP receptivity and its desire to put this idea into operation might then signal the opportunity for continued technical assistance.

## Proposed Projects

USAID/Niamey plans two project design activities in FY82. They include: Pastoral and Range Development Livestock Phase II and the CDARMA project. The pastoral and range development project may provide an opportunity to introduce a livestock and range monitoring system integrated into a national preparedness plan. Table VI-3 illustrates the proposed design schedule for these projects.

Table VI-3. FY82 Proposed Project Design Schedule for AID Projects in Niger

| Project Title and Number 683-- | PID Completion DATE | Project Paper Preparation Date |
|---|---|---|
| Niger Cereals Research 0225 | - - | July 1981 June |
| Agricultural Sector Production Support 0234 | - - | July 1981 |
| Pastoral and Range Development Livestock II 0242 | January 1982 | March 1982 |
| CDARMA 0243 | November 1981 [a] | March 1982 |
| Tara II (OPG) Rural Irrigated Agricultural Development II 0245 | n.a.[b] | n.a. |
| Tapi Vert (OPG) 0240 | n.a. | n.a. |

a Mission reviewing the PID at time of this writing.

b No proposals has been received by AID/W at time of this writing.

n.a. Not applicable

## Other Donor-Assisted Projects

The World Bank, UNDP, and UNICEF have actively promoted Nigerien development projects particularly relevant to emergency preparedness. From April 1977 through March 1981, the United Nations Disaster Relief Office conducted no Nigerien relief or preparedness activities.

## UNICEF

UNICEF is giving assistance to Niger in the following three fields: maternal and child health care (MCH); drinking water supply and sanitation; and population involvement in development activities. The recommended UNICEF program for the 1981-82 period is $1,988,000. See Table VI-4 for an aid breakdown by field.

In the area of maternal and child welfare, UNICEF is supplying materials and medical and health equipment to dispensaries and rural maternity clinics as well as to urban MCH centers. UNICEF is also supplying equipment to the National health and Sanitation Service and helping to train primary level health workers.

In the area of water and sanitation, UNICEF is working with other bilateral and multilateral assistance agencies to: train Nigerien drillers on the job; increase the number of drilled wells to exploit groundwater; install pumps and form teams to maintain water points; and educate the population in environmental health.

UNICEF is also promoting the rural population's involvement though traditional youth associations, women's associations, the Niger Women's Association, and mutual-benefit production groups in order to undertake small village-level development projects such as small-scale poultry farming; reforestation to counter desertification and produce fuel wood; millet mill self-management; and hydro-agricultural development projects.

## World Bank

The current value of the World Bank's lending program in Niger is over $118 million (Table VI-5). Four ongoing agricultural sector projects are exploiting rainfed crop and livestock production and increasing the area under controlled irrigaton. In rainfed agriculture, the plan is to establish a regional productivity project in each province, and improve and make available extension, input supply, credit, and marketing services to smallholders. AID's Niamey Department Development Project is one of these productivity projects.

Table VI-4. Proposed UNICEF Program of Cooperation in Niger

| Breakdown by field of aid | Commitment (thousands of $US) |
|---|---|
| Child Health | 1,245 |
| Water Supply and Sanitation | 2,000 |
| Social Welfare Services for Children | 307 |
| Miscellaneous | 406 |
| Total | 3,988 |

Source: UNICEF Country Programme Profile, Niger, May 1980, E/ICEF/P.L.1992(REC).

Table VI-5. Current World Bank Programs in Niger

| Project Name | ($US million) Credit Number | Effective Date | Closing Date | Original Principal |
|---|---|---|---|---|
| Third Highway | 612-0 | January 1977 | December 1981 | 15.6 |
| Forestry | 800-0 | February 1979 | December 1981 | 4.5 |
| Employment Creation | 809-0 | February 1979 | June 1982 | 5.0 |
| Irrigation | 851-0 | October 1979 | June 1983 | 15.0 |
| Livestock | 885-0 | October 1979 | March 1985 | 12.0 |
| Feeder Roads | 886-0 | December 1979 | June 1984 | 10.0 |
| Second Maradi Rural Development | 1026-0 | February 1981 | December 1985 | 16.7 |
| Dosso Agricultural Development | 967-0 | February 1981 | June 1985 | 20.0 |
| Education | 1151-0 | b | n.a. | 19.6 |
| Total Project Commitments | | | | |

Source: International Development Association, Statement of Development Credits, August 31, 1981.

a Projects whose credit closing date is after November 1981.

b Agreement was signed June 1981.

n.a. Not available.

The World Bank is co-financing two of these productivity projects in Niger--the Second Maradi Rural Development Project, co-financed by IFAD and the CCCE, and the Dosso Agricultural Development Project, co-financed by the CCCE and FAC. Both aim to increase agricultural production but differ in their approaches. The Maradi Project plans to increase agricultural expansion through:

- Expanding improved cultural practices in rainfed farming areas;
- Training extensionists in line with the "Training and Visit System";
- Providing agricultural credit to purchase farm equipment and other agricultural inputs;
- Developing 740 ha of irrigated land;
- Constructing and equiping an irrigation center;
- Applying agricultural research; and
- Providing a seed multiplication program.

The Dosso Project has a livestock component and primarily aims to increase food production through rainfed agricultural techniques, although it has a small irrigated production component as well. It also plans to:

- Construct a training center for village extension works and introduce the Training and Visit System through a training program;
- Improve farming practices;
- Strengthen the farm imput and implement supply system and construct rural cooperating centers;
- Improve animal vaccination coverage, delivery of drugs and food supplements; and animal husbandry practices;
- Establish a rural engineering unit to construct rural works and small-scale irrigation on bottomlands; and
- Apply agricultural research.

Both projects seem to have taken into account the environmental hazards of drought. Irrigation work construction also seems to have taken into account occasional torrential rains which cause isolated flooding in some areas. There seems to be only marginal preparedness opportunities currently within the context of these projects.

The Irrigation Project is an interesting scheme since it combines productive activity with research, training and, most importantly, recognizes the important linkages between water resource development and health. Improving health services is one project component, though admittedly a smaller-scale activity. The project seeks to increase Niger's rice production by developing irrigated agriculture, and also improve participating farmers' income. Project activities include:

- Constructing the Namarigoungou polder (dike, irrigation and drainage systems, and on-farm works);
- Providing services to area farmers such as irrigated water, delivery, assistance in organization, extension, applied research and seed multiplication, and procurement of inputs, credit and marketing;
- Improving health services;
- Training project staff, farmers, and artisans;
- Providing necessary physical infrastructure and equipment; and
- Preparing the feasibility study for a nearby polder.

The Office National des Amenagements Hydroagricoles (ONAHA) is implementing the project except for the health component which is being carried out under MOH supervision. The MOH is organizing a training component of village-level workers and providing them with a first aid kit and supervision and refresher courses. At the time of the appraisal mission, the MOH gave assurances that a limited epidemiological desk study of the area would be carried out and determination made with IDA to decide whether an additional epidemiological field survey to collect basic health information was warranted.

No information is available to determine whether or not this survey was completed. If not, a potential opportunity might exist for conducting such a survey. Epidemiological data is necessary to plan effectively for recurring health emergencies. This survey would also provide the opportunity to gather data for preparedness purposes. If the MOH has not already conducted it or is planning similar activities where water resources are being developed, discussions might be initiated with MOH officials to determine the feasibility of such a preparedness survey in conjunction with the epidemiological data gathering.

The Livestock Project's goals are to boost income through increased livestock productivity; obtain pastoralist participation in animal, water and pasture resource management; broaden the competence of the MRD's Livestock Department; more closely

integrate animal and crop production; and increase and improve cattle and sheep fattening by smallholders. Project activities include;

- Delivering drugs, feed supplements, and vaccines;
- Delineating pastoral units, and constructing and operating pastoral centers to serve several pastoralist associations;
- Providing a package of animal health, supplies, and technical assistance;
- Providing credit; and
- Extending the existing animal health and marketing infrastructure by constructing and improving abattoirs, vaccination yards, and small markets.

A project management unit has been set up within the MRD's Livestock Department at Zinder. It is responsible for the coordinated intervention of the different government agencies involved. The World Bank has planned to provide several short-term consultants to the project, one to monitor animal health and productivity activities. A potential opportunity might exist within this project to convince the MRD that a more extensive livestock monitoring and surveillance system is needed to collect data on a continuous basis, not only on production and animal health, but also on environmental deterioration as a result of inadequate rangeland management practices. The need for this kind of hazard analysis could be discussed with MRD and project officials.

A listing of proposed World Bank projects in Niger can be found in Table VI-6. Of these projects, the Technical Assistance Project shows the most promise of emergency preparedness opportunities.

UNDP

UNDP's 1977-81 Indicative Planning Figure (IPF) is an estimated $19,256,506. The proposed 1982-86 IPF was not available.

One of Niger's currently crucial development problems is an insufficient national capacity to ensure the satisfactory execution and supervision of all projected and current projects. The internal and external financial resources available for

Table VI-6. Proposed World Bank Projects in Niger (as of June 1981)

| Project Name | Government Agency | Description | Total IDA Commitment | Status |
|---|---|---|---|---|
| Education I | Ministry of Rural Development<br>Ministry of National Educa-<br>Ministry of Public Affairs | Improvement and extension of agricultural and animal production staff training institutes; funds for education planning and preparation of future projects; funds for planning policies and programs for upgrading civil servants. | $21.5a | Approved by the Executive Directors May 26, 1981. |
| Highways IV | Ministry of Public Works | Strengthening and resealing bitumen roads, road construction, training of road maintenance personnel. | $22.0b | Pre-appraisal team in the field in June 1981. |
| Technical Assistance | Ministry of Planning | Technical assistance for project preparation to strengthen planning, monitoring, and evaluation capabilities of Ministry of planning and technical ministries. | $9.0 | Post-appraisal mission scheduled for August 1981 |
| Employment Creation II | Development Bank of Niger (BDRN/Office of Nigerien Enterprise Promotion (OPEN) | A follow-up project consisting of a credit line to BDRN, technical assistance to OPEN, and leather craft development. ment. | 16.0 | Post-appraisal mission scheduled for June 1981. |
| Forestry I | Ministry of Rural Development | Establishing and managing state-managed and rural forestry plantations; managing of rural forests; soil conservation program; institution building; establish and monitor rural mini-nurseries. | 23.0c | Appraisal mission in the field in June 1981. |

a Co-financing with UNDP arranged.

b Co-financing with PADEA being sought.

c Co-financing with FAC and CCCE.

Sources: World Bank Monthly Operational Summary, Johns Hopkins University Press, 1 June 1981.

development are increasing, but technical resources and trained personnel are insufficient to meet the demands that the rapid pace of social and economic development place on the administration and various public bodies.

Under the 1977-81 program, UNDP is addressing this problem by channeling its assistance to two types of projects. First, it will strengthen various governmental services to increase their ability to plan and execute sectoral programs. Second, it will strengthen national training establishments or projects with substantial training components[12].

UNDP efforts are directed to making the best possible use of arable land and increasing food production. Another priority is to combat the vegetation cover's deterioration as part of a growing campaign to stop desertification and increase timber reserves. Ranking third in order of magnitude, investment under the three-year UNDP human resources program represents 15.3 percent of the total. Of this investment, 29 percent is allocated to health and 54 percent to education. Table VI-7 presents a further breakdown by assistance sector.

The human resources sector is one of the key areas using UNDP assistance. Emphasis is placed primarily on technical and vocational training either by supporting Nigerien vocational training institutions, on-the-job training, or granting scholarships for specialized higher-level studies. Although they are not all included in the human resources sector, it should be noted that most UNDP-financed projects have fairly large training components. Furthermore, Niger participates in several regional projects aimed at expanding or strengthening training programs in Africa (for example, AGRHYMET).

Niger's industrial sector is still rather small. The impediments to its development are many and traditional, namely, a limited market, the high costs of production factors (except manpower), the lack of trained personnel, and the weakness of institutions responsible for studying and promoting industrial projects. The agro-industrial branch, the largest in the industrial sector, has also suffered from the drought which reduced raw material resources (particularly groundnuts, meat, leather, and hides). UNDP industrial sector assistance is negligible, except for private sector investments. Table VI-8 illustrates a selected list of UNDP-financed projects in Niger. Regional project descriptions are presented in chapter nine.

Table VI-7. Sector Breakdown of UNDP Assistance Program in Niger (1977-81)

($U.S.)

| Sector | 1977 | 1978 | 1979 | 1980 | 1981 | Total |
|---|---|---|---|---|---|---|
| Rural Production | 810,074 | 813,074 | 1,246,460 | 1,518,215 | 1,559,442 | 5,947,551 |
| Human Resources | 547,137 | 854,591 | 652,180 | 380,000 | 425,000 | 2,858,908 |
| Industry, Mining and Trade | 500,725 | 804,714 | 1,250,000 | 1,475,000 | 1,200,000 | 5,230,439 |
| Infrastructure, Public Works and Water Supply | 1,071,184 | 998,511 | 449,600 | 234,100 | -- | 2,753,395 |
| Program Reserve | 20,880 | 8,824 | 26,760 | 992,685 | 2,253,955 | 3,303,104 |
| Total | 2,950,000 | 3,480,000 | 3,625,000 | 4,600,000 | 5,438,397 | 20,093,397[a] |

[a]This figure does not match the IPF given in narrative due to deduction because of 1972-76 overspending.

Source: UNDP, Country Programme for Niger, August 1977, DP/GC/NER/R.2.

Table VI-8. Selected UNDP Projects In Niger

| Project Name | Description | Executing Agency | Period of Assistance | Total UNDP Contribution ($U.S. 000) |
|---|---|---|---|---|
| Soil Cartography | Train project staff to interpret LANDSAT photo-imagery, perform studies, and develop and provide equipment for a soils laboratory. | FAO | 1978-82 | 1,742 |
| Assistance in National Planning | Help GON officials design next 5-year Plan. | United Nations | 1980-82 | 961 |
| Reform and Extension of the Practical Institute for Rural Development at Kolo Phase I | To execute a training system, including trainers, prepare a plan for replacing expatriate personnel with Nigeriens, and establish an information and documentation center. | FAO | 1978-81 | 305 |
| AGRHYMET | To improve and reinforce the quality of meteorological and hydrological observations, organize an agrometeorological and hydrological service, and recruit and train personnel as necessary. | WMO | 1978-81 | 709 |
| Agricultural Statistics | To advance capacity of Statistical Service of the Directorate for Agriculture to produce independent statistical material on agricultural and livestock sector developments. | FAO | 1979-81 | 674 |
| Fisheries Project | To strengthen the Fisheries Service in the Department of Water and Forests to conduct studies and implement projects. | FAO | 1981-85 | 1,690 |
| Agr altural Planning | n.a. | FAO | n.a. | n.a. |
| Livestock Extension Project | New project, not yet started. | FAO | n.a. | n.a. |
| Development of the Onchio-Freed Zones | Continuing previous rice production work. | n.a. | n.a. | n.a. |

| | | | | |
|---|---|---|---|---|
| Hydrological Forecasting | n.a. | n.a. | n.a. | n.a. |
| Kandaji Dam | New agricultural production project to start in 1983 or 1984. | FAO | 1983-86 | n.a. |
| Family Health Project | New Project. | WHO | n.a. | n.a. |
| Rural Water Supply | Development of underground water resources including surveying and drilling. | Department of Technical Cooperation for Development | 1981-83 | 1,391 |

Source: Internal UNDP documents, UNDP Area officer for Niger, UNDP, Country Programme for Niger, August 1977, DC/GC/NER/R.2.

## CONCLUSIONS

Niger receives substantial donor assistance and the government has promoted favorable policies with respect to food production and health care. These should facilitate introducing emergency preparedness planning as project- and non-project-related activities. The following suggestions are made concerning the first steps toward this end:

- Initiate discussions with Ministry of Health personnel to introduce seminars on emergency health management principles to be introduced in biannual department-level seminars now held in conjunction with the Rural Health Improvement Project to discuss planning and management issues.

- Prepare an orientation meeting for all study tour participants coming to the United States as part of the Rural Sector Human Resources Development Project.

- Initiate discussions with the World Bank's Economic Development Institute (EDI) staff to hold a joint seminar on emergency management skills, which could be attended by Nigeriens under the Evaluation Assistance Project.

- Initiate discussions with USAID/Niamey staff and Ministry of Planning officials to introduce short-term technical assistance for teaching Evaluation Bureau staff techniques to evaluate emergency management and national disaster planning.

- Initiate discussions with USAID/Niamey staff to determine the feasibility of designing a national-level livestock and range monitoring and surveillance plan which could be implemented as part of the Pastoral and Range Development Livestock II Project scheduled for PID preparation in January 1982.

- Determine whether an epidemiological study has been carried out within the World Bank-financed Irrigation Project and, if not, investigate the possibility of conducting such a survey along with introducing an emergency health preparedness plan.

- Initiate discussions with the World Bank and Ministry of Rural Development Livestock Department officials to determine the feasibility of introducing a national livestock and range monitoring and surveillance plan as part of the World Bank's Livestock Project.

# NOTES TO CHAPTER SIX

## NIGER

1. World Bank, Second Maradi Rural Development Project, Staff Apprisal Report, May 1980, p. 6.
2. OFDA, U.S. Disaster History Summary Sheet, printout, 1981.
3. Second Maradi Rural Development Project, p.2.
4. Ibid.
5. AID, Annual Budget Submission FY83, June 1981.
6. Arid Lands Resource Center, Draft Environment Examination of Niger, September 1980.
7. World Bank, Niger Livestock Project, Staff Appraisal Report, February 1979, p. 4.
8. AID, Niger Health Sector Assessment, 1977.
9. AID, Rural Health Improvement Project Paper, 1978.
10. AID, Annual Budget Submission FY83, June 1981.
11. Ibid.
12. UNDP, Country Programme for Niger, August 1977, DP.GC/NER/R.2.

# CHAPTER SEVEN

## SENEGAL

The most western state in West Africa, Senegal is a flat country separated from Mauritania by the Senegal River; from Mali in the east by the Faleme River; and bordered by Guinea and Guinea-Bissau in the south. The Gambia cuts into southern Senegal like a 10,000 sq km finger along the Gambia River.

Senegal has 6 million people. About 60 percent of the 4.5 million rural population is concentrated within 150 km of Dakar in the central Groundnut Basin. This area covers 25 percent of the country, and local population densities often exceed 100 sq km.

Senegal's climate is dominated by a monsoon that moves southeast to northwest across the country from June to October, then retreats along the same path[1]. The southwest receives the most rain (1300 to 1500 mm annually over the course of 100 days). In the north, an average 350 mm is received during a 30-day period. The semi-arid Sahel covers most of Senegal north of the 150th parallel. This region's susceptibility to periodic drought and the social, economic, and environmental disruptions these recurrent phenomena cause are increasingly well documented.

Despite certain advantages other Sahelian countries lack, most of Senegal's people are poor. What distinguishes Senegal from other Sahelian countries is the presence of much greater variations in regional income distribution and social service access. Senegal's relative advantage largely results from its comparatively well-developed administrative, commercial, and industrial center, the capital/port city of Dakar, and its commercialized agriculture which is much more widespread than in other Sahelian countries.

Another advantage Senegal enjoys is transportation facilities which are better developed than elsewhere in the region. Dakar has a first-class port with 8000 meters of sheltered quay and 46 berths. A fishing port is being developed at Dakar and there are proposals for constructing a naval repair yard to service bulk oil carriers. Senegal has 14,500 km of roads, 3,000 km of which are paved. Moreover, 1186 km of railroad track link Senegal with Mali and Mauritania[2].

Despite these advantages, Senegal also suffers from the same kinds of environmental hazards as do other Sahelian countries, namely drought and disease. The following section will discuss these events within the context of Senegalese development planning.

## DISASTERS IN SENEGAL

The Government of Senegal (GOS) has asked for international emergency assistance to combat drought 12 out of the past 17 years. Since 1969, U.S. assistance alone has totaled $32.5 million. Senegal has also suffered outbreaks of cholera, yellow fever, civil strife, and storms, all requiring international assistance[3].

In addition, Senegal is prone to damaging brush fires. While not requiring international emergency assistance, they do constitute a serious environmental hazard. Approximately 40 percent of the country is burned each year, destroying pasturage, crops, forests, and sometimes habitations. Fires are set for several reasons--to clear land, destroy snake- and pest-infested brush around villages, drive game, smoke wild bees from hives to collect honey, or simply by accident. The harm brush fires do is immeasurable. Indeed fire is one of the principal causes of Senegalese deforestation.

Senegal is also prone to floods. The Senegal River rises in Guinea and flows 4000 km along the northern border to its mouth at Saint-Louis, creating a 72,000 sq km Senegalese watershed. Its tributaries are the Bafing, Bakoye, and Faleme rivers which have their source in a Guinean area where annual rainfall is at least 1200 mm. Floods these rains produce occur in Senegal in September and the flood crest takes about six weeks to reach the sea. The Senegal River's flat gradient also permits ocean tides to salt the river for nearly 250 km upstream. Although local fishermen catch anadramous fish, the brackish water is harmful to local agriculture. For that reason, several structures have been built on the river to prevent saltwater intrusion.

Agriculture suffered serious losses during the 1968-73 drought and again in 1977 and 1979. The resulting population exodus from rural areas greatly reduced cultivated farmland to the point where only 12 percent of the country is currently under cultivation[4].

The 1977 drought reduced Senegal's major crop harvest 25 to 45 percent, cut groundnut oil 44 percent, and caused other industrial production cutbacks as well. The post-drought record of the last five years has been one of slow growth. Sharp economic performance fluctuations still point out Senegal's extreme vulnerability to both weather conditions and world groundnut and phosphate prices. The following discussion focuses on how drought and environmental degradation have affected Senegalese food production and what epidemic outbreaks indicate about the country's health care system.

Drought and Food Production

Agriculture is the dominant economic activity, providing 70 percent of labor force employment. The economy is near totally dependent on the groundnut cash crop grown almost exclusively for export. Climatic conditions and world groundnut prices determine Senegal's balance of trade. Senegal also suffers from chronic foodstuff shortages. Senegalese diet staples are millet and sorghum. Rice, wheat, and maize are also important. Agricultural production is about equally divided between producing groundnuts for export and millet and sorghum for domestic consumption. Crop diversification programs have been underway since 1969, and the future of cotton, vegetable, and rice production look promising. In 1976, however, only about 5 percent of all Senegalese farmers were raising these alternative crops. Rice is the staple food for Senegal's urban population.

The disastrous 1967-73 drought prompted speculation that a climatic shift toward drier conditions was in progress. However, examining the record shows there has been no major climate changes, only fluctuations that can be expected due to the Sahel's geographic position and the random precipitation patterns. Major droughts are simply part of the Sahelian climate. In Senegal, as elsewhere in the Sahel, planning is in progress to reduce the damaging effects of wet year/dry year variations by storing surface water and food during periods of abundance and releasing them slowly during dry periods.

Senegal's territory is 22 percent arid and 70 percent semi-arid. Thus nearly all of Senegal is threatened by the effects of drought and desertification, defined as marginal dry lands that convert to absolute desert due to drought conditions and overly intensive land use[5]. The most critically marginal areas are the northern part of the Fleuve region, Senegal-Oriental, the eastern central zone of Casamance and the Cap Vert region.

Despite Senegal's erratic rainfall patterns and generally poor soils, the agricultural sector operates below potential. Major constraints are inadequate input distribution channels, high transport costs, and few feeder roads (especially in developing areas). These factors account for the Groundnut Basin population's reluctance to settle elsewhere, thereby relieving already overcropped land. In addition, historic disincentives to produce millet and store surpluses instead of groundnuts help perpetuate Senegal's increasing dependence on foreign food grains. The GOS is beginning to take some steps to remove these historic constraints to grow and store millet in favor of groundnut production. These include increasingly emphasizing agricultural development by improving rainfed agriculture, gradually developing irrigated perimeters, giving more attention to livestock production, and improving rural area social infrastructure.

The GOS has a long-term agricultural strategy aimed at crop diversification, particularly in cotton, maize, and upland rice in areas of low or fluctuating rainfall such as the Casamance and eastern Senegal. Major irrigation schemes in the Senegal River basin and Casamance are also part of the diversification efforts.

Between the early drought years through 1977, some $326 million was directed toward agricultural development projects, more than half toward increasing crop production. Specific measures include:

- Increased allocation of government funds into the agricultural sector;
- Subsidizing farm production inputs;
- Price policy changes to influence production and consumption patterns that included progressive and substantial producer price increases for sorghum, millet, corn, and groundnuts, and eliminating consumer wheat and rice subsidies;
- Decentralizing the development process by strengthening the regional development agencies (RDAs), restructuring key support activities such as agricultural research, and linking cooperatives with the RDAs;
- Strengthening the cooperatives development process role, and giving cooperatives partial control of credit and food crop inputs in conjunction with the RDAs (as financial and managerial strength increase, co-ops will be expected to play a greater role in marketing crops other then groundnuts);
- Efforts to manage and conserve Senegal's natural resources with emphasis on the resultant impact on agricultural and livestock production; and
- Reviewing Senegalese pricing and marketing policies to obtain optimum agricultural diversification program results and assure balanced food and cash crop production[6].

The Ministry of Rural Development (MRD) has overall responsibility for rural sector development, but increasing responsibility is being given to regional development agencies. These agencies include SAED for Senegal Valley irrigation; SODEFITEX for southeast Senegal extension work and cotton marketing; SODESP for extension work and cattle marketing in the semi-arid north central region; SODEVA for Groundnut Basin extension work, SOMIVAC for Casamance planning and project execution; and STN for land settlement, primarily in the

southeast. The RDAs have differing degrees of financial and managerial automony. This is due partly to their status as wholly government-owned enterprises (SAED, SODESP, SOMIVAC, STN) or mixed enterprises with minority private ownership (SODEFITEX, SODEVA). The agencies are not merely executing bodies, but undertake investment planning as well. SAED, SODEVA and SOMIVAC have planning units which receive considerable foreign technical assistance.

Constraints to Senegalese agricultural development can be summarized as follows:

- Poor natural resource endowment. Senegal's agricultural development is constrained by generally poor soils, arable land lost to desertification and erosion, and limited water resources. Rainfall is highly variable and much presently irrigable land suffers from saltwater incursion. While Senegal has considerable irrigation potential, it depends on costly infrastructure investment.

- Limited human resource development. While Senegal has developed some indigenous technical and administrative expertise, it still lacks the necessary personnel, particularly at mid-levels, to carry out its development programs.

- Inadequate agricultural research and extension services. Senegal has made some advances in developing appropriate technical packages for Groundnut Basin food crops. There is a pressing need for research on appropriate technological packages for the Casamance, Senegal-Oriental and the Fleuve regions. In addition, the extension services are inadequate for the development activity level being undertaken.

- Lack of local food crop storage. Until the recent emphasis on agricultural development took place, there had been no major marketable food grain surplus in the country. Now there is an extensive program underway to increase central market storage, but lack of storage still remains a local level problem.

Thus the potential for agricultural production less sensitive to climate and rainfall variations is yet to be developed, and several macropolicy and macroeconomic constraints still hinder progress in this area. However, some policy changes are being made which should make it easier to target development efforts to drought- and cash crop-dependent areas. A later section will discuss current and proposed development efforts directed toward alleviating some of these problems.

Marine and continental fisheries also make an important contribution to the Senegalese diet, accounting for 80 percent of all "animal" products eaten. Fish are harvested both from coastal waters and the four major river systems, particularly the Senegal River. Saltwater species are marketed fresh as far as 100 km inland from the coast where good road systems allow rapid transport. Senegal River basin development will affect the continental fishing industry in a major way, and its impact has been carefully studied. The government has also placed great emphasis on developing fisheries, especially maritime fishing. The targets are to motorize all seagoing fishing vessels by 1981, develop fish processing industries, and increase exports and local consumption.

The livestock subsector has traditionally played a very important stabilizing role in the Senegalese economy. However, the worst drought in Senegalese history in the late 1960s and early 1970s produced a severe livestock industry decline. While livestock is a less important sector for the Senegelese economy than in other Sahelian countries (contributing about 7 percent of the GNP), the extent pastoral activities have contributed to Sahelian environmental deterioration and the amount the pastoralists suffered in the drought are disproportionately high. The government trend now is to integrate livestock raising with other farming activities so as to increasingly diversify the agricultural sector.

The country's principal resource limitation is water. More than any other natural cause, this constraint explains the vulnerability of Senegal's agriculture. Major drought in six of the last 10 years has contributed greatly to depressed growth rates. This has affected farmers' willingness to adopt capital-based innovations. Groundwater reserves are generally known, but more accurate maps and recharge studies are required. River basin water development is expensive in the Senegal and Gambia river basins. Riverine food production through irrigation is a long-term proposition, but offers security against drought that Senegal needs.

The population growth rate is another constraint. Officially recorded at 2.7 percent, unofficial estimates cite 3.3 percent as more nearly correct[7]. Combined with sluggish or negative economic growth, population growth has serious implications for disaster preparedness and development.

The extreme regional population distribution is also a problem. An estimated 40 percent of Senegalese inhabit less than 4 percent of the country along the Dakar/Thies axis. Migration analysis shows this trend is growing rather than diminishing. Unless this trend is reversed, the greater Dakar area with 1 million persons today will hold approximately 40 percent of Senegal's estimated 4 million population by the year 2000. The implications of this population structure for food imports and future drought disasters are staggering[8].

Epidemics and Health Care

The most prevalent diseases are malaria, tuberculosis, measles, trachoma, trypanosomiasis, schistomsomiasis, dysentery, and gastrointestinal diseases in children. Less prevalent but susceptible to recurrent outbreaks are yellow fever, meningitis, tetanus, and leprosy. Malaria is considered the most serious health threat and is endemic in all areas of Senegal with over 500,000 cases reported in 1971.

About three-fourths of Senegal's population under age 30 is suspected of having malaria. The other insect-transmitted diseases, although locally virulent, do not affect such a large proportion of the population. Schistosomiasis affects about 10 percent of the population in the Senegal delta and about 40 percent of those living along the Malian border[9]. All of Senegal-Oriental is highly infected with onchocerciasis (river blindness) to the extent that most fertile land near river bottoms cannot be permanently settled. WHO has begun a vector control program for the simulid flies transmitting the disease. Trypanosomiasis (sleeping sickness) is also a potential problem due to the widespread infection of wild antelopes, domestic dogs, pigs, and goats in the endemic areas of Cap Vert, the Gambia River basin, Casamance, and Senegal-Oriental. The Senegal River basin is an area of particularly serious endemic and epidemic disease. Water resource development presents serious health hazards. The incidence of malaria, schistosomiasis, onchocerciasis, cholera, yellow fever, and guinea worm could all rise dramatically.

Other diseases are related to poor sanitation and pollution. Principal diseases transmitted by unsafe drinking water are dysentery, gastrointestinal diseases of children (a leading cause of death in children under five), typhoid fever, cholera, and hepatitis.

Superimposed over Senegalese disease problems is pervasive malnutrition. While Senegal's current state of malnutrition cannot be stated with statistical precision, high infant mortality and generally low income levels indicate malnutrition is present in varying degrees of severity. It takes three interrelated forms: seasonal undernutrition; widespread protein caloric malnutrition; and nutrient and vitamin deficiencies. It is estimated that per capita caloric intake is 15 to 10 percent lower than international standards recommend. Even this substandard diet is 10 to 15 percent lower during the rainy period before the harvest (June through October). This is the time for planting and weeding. It requires maximum energy but coincides with Senegal's highest seasonal rates of malaria and diarrhea/dysentery. There is also a sharp increase in infant mortality and morbidity during this season, and illnesses cut into labor availability.

Although progress has been made in addressing Senegal's health problems, especially endemic disease, analyzing present sectoral constraints and causes indicates that service delivery problems, lack of trained personnel, and funding are clearly the priority issues to be addressed.

In summary, there are inadequate numbers of trained personnel at all levels, a lack of supervision all along the health delivery system chains, inadequate numbers of rural health posts, inadequate essential basic drug supplies, a weak logistical infrastructure, and inadequate health sector funding.

The GOS is attempting to reorganize the structure of the Ministry of Health (MOH) to improve its rural area implementation capability. This involves plans to remodel old health posts and build new ones, procure logistical equipment supplies for mobile units, develop basic health services, increase the effectiveness of cold-chain vaccine storage, establish a new school of nursing, monitor endemic disease outbreaks, provide nutritional protection, establish regional pharmacies, promote campaigns against tuberculosis, and promote rural communities' ability to become self-sufficient by disseminating health information. Such major reforms will take a long time to achieve. AID is contributing to them in its assistance strategy.

## DISASTER PREPAREDNESS IN SENEGAL

Like other Sahelian states, Senegal appointed a Disaster Relief Coordinator in 1974 in response to the regional drought. This coordinator headed a Disaster Relief Department within the Ministry of Planning and Cooperation and was responsible for coordinating all disaster relief activities. Specific responsibilities included distributing and transporting all relief supplies within Senegal, and paying all transportation and warehousing expenses[10].

UNDRO has recently offered technical assistance to Senegal to review its national plan and organization. No details are presently available to indicate the nature of any changes instituted.

## AID ASSISTANCE STRATEGY IN SENEGAL

The long-range goal of U.S. assistance to Senegal is food self-sufficiency, defined as Senegal's capacity to feed its people by domestic production, storage, and trade even in drought years. Two comlementary program strategies will help achieve these goals. The first, in agriculture, will aim at significantly increasing and diversifying production and trade. The second, in human resource develoment, will seek to ensure improved nutrition and access to family health facilities.

The pursuit of these strategies has required some modification in the character of the USAID/Dakar program. First, USAID/Dakar has recommended establishing a consultative group for Senegal to mobilize assistance for carrying out Senegal's Reform Plan. A well-organized form of donor collaboration would ensure more concerted support for these reforms and more effective use of such donor support by Senegal itself. A second major USAID/Dakar programming change will place a greater emphasis upon non-project assistance. During FY80-82 $7 million of assistance was directed as non-project assistance. In FY83 $20 million of assistance is targeted in this way. Of this $20 million, $15 million will be P.L. 480 Title III and $5 million will be devoted to agricultural sector grants[11].

A third change is that USAID/Dakar will use local currency proceeds to train and equip selected producer groups, cooperatives, and community councils directed through the RDAs and a parallel set of activities to build farmers' groups and cooperatives to stimulate local commerce.

USAID/Dakar's agriculture program will address four main targets:

- The progressive decontrol and commercialization of rural production;
- Developing more effective agronomic practices;
- Increasing cultivated land areas; and
- Improving soil and water resource management.

USAID/Dakar activities will be concentrated in the Fleuve, Sine-Saloum, Casamance, and Groundnut Basin areas.

USAID/Dakar's human development program focuses on two objectives: achieving an effective food/nutrition strategy to help Senegal refine its national food strategy, and improving access to primary health care. USAID/Dakar will support the National School of Applied Economics (ENEA) in organizing two four-week incountry nutrition strategy workshops. Drawing upon assistance from AID's Development Support Bureau, these workshops

will be held in April and November 1981 for planners in those key ministries (Planning, Finance, Rural Development, Research and Technology, Human Resources Development, Women's Affairs, and Health) and national agencies principally concerned with the rural sector food supply and marketing programs. Workshop participants will examine what is known about the current food situation, including the role of food aid; international efforts to develop a conceptual framework for national food and nutrition strategies as led by the World Food Council; Senegalese programs and initiatives to address food self-sufficiency; and roles the separate ministries and agencies could pursue given their own specialized authorities and responsibilities. In this way, the workships are intended to help lay the ground for Senegalese entitites to define a more cohesive food investment and supply strategy. The workshop experience should also help various government components in their work with local level enterprises, both public and private.

A second objective is improved access to primary health care. The CDSS health sector will be revised in January 1982 based upon a thorough review of Senegal's health sector needs. The health sector review will concentrate on identifying the most significant ways in which improved agricultural production can be linked to health care, and the most effective means for introducing child spacing and maternal child health (MCH) services within the primary health care context.

The following discussion examines some of the current and proposed AID development assistance efforts in Senegal in more detail and identifies areas where disaster preparedness might be most effectively introduced (Table VII-1).

## P.L 480 Program

Senegal receives both Title II and Title III food assistance. Both programs are substantial and have complementary objectives. They also are particularly important to emergency preparedness activities. Therefore, the current and proposed programs will be discussed separately in the following section.

### Title II

The FY82 P.L. 480 Title II program has three objectives. The first is maternal child health, which constitutes 90 percent of Title II recipients. Its objectives are to provide critical nutrients to children under six and mothers of child-bearing age, educate mothers to combat malnutrition and infection to reduce infant morbidity and mortality, and lessen the rural family's expectation of infant death, thereby supporting family planning efforts.

Table VII-1. Ongoing and Proposed AID-Funded Projects in Senegal

| Project Name and Number 685-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Range and Livestock Development, Toul-kedi Phase I Extension 0202 | To improve livestock production within the zone through establishment of a comprehensive grazing plan, improved water resources, establishment of a strong extension program, and a project monitoring system. | 75 | 82 | 600 | -- | 5,736 |
| Casamance Regional Development 0205 | To bring underutilized land into full food production in the region of Ziguinchor in the Lower Casamance; to build GOS institutions involved in the planning, research and extension of food (primarily rice) production in this area. | 78 | 85 | 3000 | 4000 | 23,700 |
| Small Irrigated Perimeters 0208 | To introduce irrigated culture technologies in 21 villages along the Senegal River in the Bakel area to demonstrate the feasibility, technically and economically, of irrigation in the area. | 77 | 81 | -- | -- | 2,400 |
| Rural Health Services 0210 | The Sine-Saloum Rural Health Project will provide a system of basic health service delivery to the region's rural population, (with full community participation in selecting village health workers) as well as support and provide village health facilities. | 79 | 83 | n.a. | n.a. | 1,800 |
| Family Health Services 0217 | To provide medically sound, culturally acceptable child-spacing health services integrated into the existing health care system and provide widespread community health education in reproduction and family health. | 79 | 82[a] | 500 | -- | 1,400 |
| SAED Training 0218 | To provide training in equipment maintenance to the GOS's extension force (SAED) in the Senegal River Valley. | 78 | 83 | 1100 | -- | 4,500 |
| Fuelwood Production 0219 | To stabilize and increase national fuelwood (charcoal, firewood) production potential and to halt or reverse environmental deterioration due to inadequate national forest cover in upcountry areas where rapid deforestation results from widescale tree cutting for fuel purposes. | 79 | 82 | 300 | -- | 3,100 |

Table VII-1. (continued)

| Project Name and Number 685-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Youth Job Development 0202 (YMCA/OFT) | To build an integrated system of vocational training services enabling unemployed Senegalese youth to obtain marketable skills and offer them assistance with job placement and counselling. | 79 | 83 | 750 | 500 | 1,800 |
| Agricultural Research and Planning 0223 | To develop within the government research apparatus the capability for making socio-economic analyses in areas of appropriate farm systems, farm price policy and the nutrition and consumption impact of agricultural development alternatives. | 81 | 85 | 1250 | 1000 | 5000 |
| EODESP Livestock Production 0224 | To develop a cost-effective and implementable resource management system and livestock production and marketing program suitable to the physical characteristics of the sylvopastoral zone, recognize and confirm economic exigencies and permit a pattern of socially acceptable evolution from present traditional grazing patterns and practices to a more productive system of livestock raising and resource management. | 79 | 83 | 1500 | 970 | 8000 |
| National Plan for Land Use 0233 | INSERT | 81 | 82 | 1000 | -- | 2000 |
| Cereals Production II 0235 | To reinforce SODEVA extension efforts developed and improved upon during the project's first four-year phase. Areas of concentration will be extension of peanut and millet production, crop diversification, livestock raising, the role of women, and applied farm-level research. The project will contribute to agricultural productivity through extension, with emphasis on cereals and other products beneficial to farm families in Senegal's Groundnut Basin. | 80 | 84 | 2500 | 1000 | 7700 |
| Rural Health II 0242 | Extension of Rural Health Services Development (0210). To identify a methodology to deliver health services at the rural community and the village level. | | | | | |

Table VII-j. (continued)

| Project Name and Number 685-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Renewable Energy II 0246 | To develop several prototype renewable energy production and conversion processes for the rural Senegalese communities. | 82 | 85 | 1,000 | 1,000 | 4,600 |
| Family Health II 0248 | Extension of Family Health Phase I (0217). Expanded phase will be located primarily in the Sine-Saloum, Casmance and Fleuve regions. Family health services will be provided by MCH and rural women's centers. | 83 | 87 | -- | 1,000 | 7,000 |
| Agricultural Sector Grant 0249 | To make available $5 million per year to import U.S. source and origin agriculture sector inputs such as fertilizers, agricultural chemicals, pesticides, agricultural machinery, and tools to produce, market, and process agricultural products. | 82 | 86 | 4,000 | 5,000 | 25,000 |
| Millet Processing 0250 | To carry out food technology, market research, and feasibility studies on transforming millet into one or more processed food products which are economically and esthetically acceptable. | 81 | 81 | 500 | -- | 500 |
| Rural Managment (ENEA) 0256 | To support the revision and upgrading of the educational program at the National School of Applied Economics (Ecole Nationale d'Economie Applique, ENEA) thereby enabling ENEA to more effectively support the new GOS rural development strategy. | 82 | 85 | 500 | 530 | 2,000 |
| Dand Resource Regeneration 0257 | To establish an extensive impact program with modified farm and soil management practices which provide resource protection and improvement. | 83 | 86 | -- | 1,000 | 4,250 |
| Cooperative Operations 0258 | To help management improvement and structural reorganization of the cooperatives and service centers of the "groupement villageois". | 83 | 86 | -- | 1,000 | 4,750 |
| Fuelwood Production II 0259 | To expand the Senegal Fuelwood I (0219). Under the second phase, an additional 3000 ha of intensely managed forest plantations in the Thies area will be planted with fast-growing species. Harvesting and replacing will also begin on a rotational basis, thus establishing a renewable energy unit. | 83 | 85 | -- | 1,000 | 4,000 |

Table VII-1. (continued)

| Project Name and Number 685-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| PVO Sector Grant 0260 | To provide a funding and evaluation mechanism through which U.S. and indigenous PVOs can undertake activities designed to promote the well-being of rural poor, while minimizing demands on scarce AID direct-hire manpower. | 83 | 85 | -- | 1,500 | 4,500 |
| Agricultural Sector Training | To train the middle-level administrative and management personnel required for government, the development agencies and private business in the agricultural sector. | 83 | 85 | -- | 1,000 | 4,750 |

n.a. Not available

[a] Continuing differences between the Ministry of Health (MOH) and the Secretary of State for Promotion Humaine (SEPT) have caused delays in project implementation. In April 1981 SEPH proposed a work plan to USAID which has MOH approval. The present work plan will be revised so that it is acceptable to USAID and implementation should begin by the end of summer 1981. This will mean a delay in Phase II design.

Sources: FY82 Congressional Presentation, FY82 and FY83 Annual Budget Submissions, Senegal, June 1980 and June 1981.

The second objective is the food for work component which constitutes 7 percent of Title II recipients. Its goal is to provide food as a partial wage in projects designed to grow more food and provide gainful employment for Senegal's rural unemployed.

The third objective is adult health, which constitutes 3 percent of Title II recipients. Its goal is to provide food relief to the aged and infirm who are otherwise unable to secure sufficient food.

Catholic Relief Services (CRS)is the implementing agency for Title II food services in Senegal. The FY82 Title II budget is $7.3 million which serves more than 240,000 recipients. The FY83 Title II program budget is $9.2 million. The program operates exclusively in rural Senegal and almost exclusively through the GOS health and development facilities. Four-fifths of these centers are located within the Groundnut Basin, the Casamance, and the Fleuve--USAID/Dakar's three geographic areas of concentration.

The Title II program is generally expected to continue as presently structured with a modest 6 to 8 percent annual increase in recipients through FY85. Beginning in FY86, the production of indigenous weaning food is expected to reduce Title II imports by roughly 20 percent per year.

Title III

Senegal's first Title III program was initiated in May 1980 and provided for the annual sale of $7 million worth of rice each fiscal year from FY80 through FY82 for a $21 million total. Starting in FY83 the program will be extended another three years at the rate of $15 million per year. The objective of the $15 million FY83 program is exclusively to increase production and trade. The goal of the ongoing Title II program is principally to improve nutrition, and with it the increased confidence in family survival required if birth rates are to be reduced.

The Title III program addresses the development problems by supporting the following activities:

- Rural technical schools;
- Rural Development Fund for rural/agricultural activities;
- Renewable Energy II;
- Fuelwood II;

- Cooperative Operations Support;
- River basin development; and
- Foodgrain reserves.

FY83 Title III-supported projects will include the National Institute of Rural Development (INDR-Thies). This activity will begin training agriculture sector specialists for mid-level administrative and management positions within GOS development agencies and private business. Development assistance and Title III funds, with support from France and the World Bank, will help establish Senegal's first university-level agricultural training facility.

Title III will also be used to change and upgrade the ENEA academic program (Dakar) in response to reforms in the role and organization of cooperatives required by the GOS Reform Plans.

In addition, Title III funds will be used to extend and expand the Rural Development Fund established under the first Title III agreement in 1980. This fund is intended to support activities which would engage villagers in project planning and implmentation. This will be accomplished in two ways. First, the Peace Corps and USAID/Dakar will embark upon a joint program to promote self sufficiency in food production. Title III funds will be used to: construct ponds and produce fresh water fish; construct village-level seed storage; identify the causes and magnitude of post-harvest grain losses; and improve the use of river water transportation for farm-to-market trade.

Another way in which the Rural Development Fund will be used is through the proposed Private Voluntary Organizations (POV) Sector Grant. This grant is intended to promote village-level participation in food production and soil conservation in the Sine-Saloum Region. Title III funds will be allocated to a working body of Senegalese and American PVOs, together with Peace Corps, to stimulate participation in development efforts such as reforestation, co-op training, and health hut operation.

In the Renewable Energy II Project, Title III funds will be used to provide local currency costs for production and field trials of prototype renewable energy production and conversion processes for rural communities.

Title III funds will also be used to help meet local currency costs in the Fuelwood III Project for clearing and planting an additional 300 ha of intensely managed forest plantations.

In the Cooperative Project, Title III funds will support local currency components to help the National Cooperative Organization improve its local and regional cooperative supervisor.

Title III funds will provide the supporting infrastructure associated with the Senegal River basin development. Although this river development scheme involves three countries, Title III funds will be used exclusively within Senegal to construct the ISRA research station at Fanaye for the OMVS Agriculture Research Project, build housing for researchers at Richard Toll, and establish other similar essential facilities.

As a logical and necessary addition to the Grain Storage Project, Title III funds will be used to purchase indigenous millet through the village co-op network for storage as a reserve against drought and a guaranteed supply source for producing millet-based foods under the Millet Processing Project.

## PROJECT ANALYSIS

Senegal received development assistance from several bilateral governmental donors, regional and international organizations, and voluntary agencies. This analysis only discusses external donor-financed national projects. An analysis of regional projects involving both Senegal and Upper Volta can be found in chapter nine.

### AID-Supported Projects

The FY82 obligation (excluding regionally-funded projects) for AID's Senegal assistance program is $18 million. Of that, $22 million is projected as the FY83 AAPL[12]. The project implementation phase for much of USAID/Dakar's program is well into its final stages. Those projects terminating this fiscal year include Family Health Services, Range and Livestock Development, Fuelwood Production, and the National Plan for Land Use and Millet Processing, although second phases have been proposed or tentatively planned for some.

Before any preparedness activities are undertaken to link extension activities with a Senegalese national level disaster plan, the results of UNDRO's consultancy to reorient the national disaster plan and organization should be reviewed. It may be appropriate to provide follow up studies or technical assistance to help the GOS implement UNDRO recommendations. With that in mind, the following preparedness activities should be integrated into the reformed national disaster plan and organization.

Current Projects

Five of the current projects terminating in FY83 and beyond have activities in someway related to emergency preparedness (Table VII-2). The preparedness activities they inspire can be grouped into two general categories: preparedness planning and training.

In the preparedness planning area, the Rural Health Services project provides the framework through which a national health preparedness plan might be implemented, if one existed. A parallel activity might be introduced to help the MOH design such a plan, keeping in mind the role that Promotion Humaine might play in its community level implementation.

The Rural Health Services Project is designed to help the GOS develop a delivery system to provide basic health services to Senegal's Sine-Saloum rural population. The approach is twofold: first, to establish a network of village health posts staffed and supported by community-level personnel throughout the region; and second, to improve and strengthen the GOS support infrastructure to provide services to secondary health centers and village health posts. The final result will be a self-sustaining village-based rudimentary health system which can be replicated in other provinces at a manageable cost.

Throughout the project, major emphasis is placed on training village health workers, as well as the in-service health post staff. The Khombole School provides additional training to increase and improve the skill areas available to the Sine-Saloum health sector. This training also includes family planning and health care components and might easily introduce a basic emergency health preparedness plan as well.

The execution of emergency health preparedness planning might be introduced through the Peace Corps which is participating in the project by helping in training and extension activities.

The Cereals Production Project, Phase II, is designed to strengthen the SODEVA extension service by upgrading field agency quality through training; organizing a women's unit to integrate extension efforts to improve the quality of life; station research to improve extension themes being promoted and developed; and using Senegalese expertise in audio-visual techniques and extension. This project might provide the framework through which an emergency food preparedness strategy could be implemented.

The primary GOS agent for implementing agricultural development schemes in the project zone is SODEVA (Societe de Developpement et de Vulgarisation Agricole). SODEVA has been actively involved in improving agicultural productivity and disseminating improved agricultural techniques at the small-farm level through its extension services since 1968.

Table VII-2. Selected AID-Supported Projects and their Associated Preparedness Needs

| Project Name and Number 685-- | Primary AID-Supported Components | Potential Preparedness Activity |
|---|---|---|
| Rural Health Servi es 0210 | Technical Assistance<br>Short-and long-term health personnel and educators.<br>Training<br>Inservice and short-term incountry.<br>Construction and logistics | Project provides model framework to introduce preparedness planning. Instituted as a parallel project the design of such a plan could integrate MOH and public health requirements in emergencies and provide complementary training through the project to institute such a plan. |
| SODESP Livestock Project 0224 | Technical Assistance<br>Long- and short-term in livestock production and marketing, range management, research and monitoring.<br>Construction and Equipment<br>Headquarters and outstations for livestock component; supplies for reforestation.<br>Revolving Fund<br>To purchase food grains and medical supplies for sale to herder families.<br>Training<br>Incountry and U.S. in livestock production and marketing, range management, forest management. | Identify students receiving U.S. training under this project and organize a training session in preparedness planning within context of livestock and range surveillance linked to a national plan. |
| Cereals Production Project II 0235 | Technical Assistance<br>Long- and short-term (agricultural economist, agronomist, audiovisual extension trainer, agricultural and extension consultants).<br>Equipment, Operating and Construction Costs Training<br>4 SODEVA and 3 CNRA at the Master's level in agricultural economics, agronomy, extension training, and extension agronomy/administration. | Opportunity to identify ways cooperatives and extension services can be used to disseminate preparedness information.<br><br>Training activity for Senegalese personnel sent to the U.S. for long-term training. |

Substantial SODEVA program support has come from the foreign donor community (USAID/Dakar, IBRD, Caisse Centrale, FAC, and FED). Its reputation as an organization capable of preparing, planning, and implementing agricultural extension programs is generally regarded as good.

The major target group for the SODEVA extension effort is the cooperative structure. These community organizations are usually the only organizational structure found in the rural areas. They represent, however rudimentarily, a potential vehicle through which preparedness information might be disseminated. The Cereals Production Project offers an opportunity to explore with SODEVA ways in which rural community-level preparedness might be enhanced.

In the preparedness training area, both the SODESP Livestock Project and Cereals Production Project, Phase II, have training components which send SODEVA and SODESP field agents to the United States for graduate-level education in animal husbandry and marketing, range and forest management, agronomy, agricultural economics, extension education, training, and administration. The presence of these students in the United States offers another opportunity to introduce preparedness planning into the educational programs of these Senegalese extension personnel.

Proposed Projects

USAID/Dakar has tentatively scheduled five project design exercises this fiscal year (Table VII-3). Of those projects, the Rural Health Services II and PVO Sector Grant have not reached the PID stage at this writing. Of the two projects, Rural Health Services II seems most appropriate for emergency preparedness. The PVO Sector is intended to provide credit and management training to small-scale rural private enterprises. Exploratory discussions could be held with the mission to determine the potential role of an emergency preparedness focus to this project. For example, Rural Health Services II's goal is to extend Phase I activities into the Sine-Saloum region's Kaffrine province and eventually to the Casamance and Fleuve regions. The goals of this extension are to help the GOS:

- Test the model developed in the Sine-Saloum region in two ecosystems, both markedly different from the Sine-Saloum and having very different ethnic group populations;

- Minimize any possible adverse health impacts of the new irrigated farming techniques being introduced in these two regions; and

- Ensure that crop production increases are translated into improvements in the nutritional status of women and children under five years of age.

Table VII-3. FY82 Proposed Project Design Schedule for AID Projects in Senegal

| Project Title and Number 685-- | PID Completion Date | Project Paper Completion Date |
|---|---|---|
| Rural Health Services II 0242 | April-May 1982 | October 1982 |
| Renewable Energy II 0246 | November 1981 | February-March 1982 |
| Family Health II 0248 | Delayed until FY83 or beyond | |
| Agricultural Sector Grant 0249 | November 1981 | February 1982 |
| Rural Management (ENEA) 0256 | October 1981 | January 1982 |
| PVO Sector Grant 0260 | May 1982 | FY83 |

Source: Interviews with AFR/DR program officer, Senegal.

This model could also be used to test the feasibility of extending an emergency health preparedness plan to rural areas.

Activities at the project paper stage include Renewable Energy II, Rural Management (ENEA), and the Agricultural Sector Grant. The Agricultural Sector Grant is a commodity import program which will provide U.S. agricultural sector inputs such as fertilizers, agricultural chemicals, pesticides, agricultural machinery, and tools for producing, marketing, and processing agricultural products. Steps should be taken within a preparedness context to ensure safe handling, use, and storage of chemical agents and pesticides. Renewable Energy II will develop several prototype renewable energy production and conversion processes for rural Senegalese communities. Technology screening and prototype testing will involve institutions such as CERER (energy), ISRA (agricultural research), and the RDA.

Rural Management (ENEA) offers the most potential for introducing an emergency preparedness component. This project will help revise and upgrade the National School of Applied Economics' educational program, thereby enabling ENEA to more effectively support the new GOS rural development strategy. The institutional changes taking place under the Reform Plan imply that major revisions are required in ENEA's academic program. ENEA is the training institution primarily responsible for preparing low- and mid-level rural managers, including cooperative personnel. Under the proposed project, several specialists will help ENEA staff revise curriculum and develop new materials through pilot teaching programs. The focus of these revisions will be to introduce training in project design, management, and evaluation techniques. ENEA staff would be provided participant training in the United States for both degree- and non-degree programs to improve staff credentials and experience with appropriate technology and methods. It might be appropriate to initiate discussions to introduce preparedness planning into the revised ENEA curriculum.

## Other Donor-Assisted Projects

The World Bank and UNDP both have substantial development assistance programs in Senegal that focus on capital-intensive infrastructure building projects. Despite a slight decrease, UNICEF support for traditional Senegalese health services will continue through 1984 at a significant level. UNDRO has also participated in a Senegal relief operation in 1979 and is offering technical assistance in disaster preparedness in 1981. The following discussion explains these activities in more detail.

UNICEF

Table VII-4 illustrates the actual and projected figures for UNICEF's Senegalese assistance program from 1981-84. UNICEF has primarily been involved in supporting implementation of the Senegalese public health system administrative reform since 1975. Senegal has adhered to an objective of health care for all citizens by the year 2000. It also set a goal of achieving complete health coverage for 200,000 inhabitants each year by closely linking basic health services and primary health care. Agencies helping to carry out this reform include WHO, UNFPA, AID, Peace Corps, French Progres volunteers, and the French, Belgian, Canadian, and Netherlands cooperation agencies.

In addition to primary health care, UNICEF provides more limited help to improve hygiene at rural community-established water points. The government has embarked on some ambitious rural water supply programs to combat the effects of the drought and is receiving support from CARITAS, CRS, and the French Progres volunteers.

UNICEF is concentrating most of its attention in 1981 on strengthening and diversifying efforts in the Fleuve region to irrigate peripheral village farmlands. It is also installing community sheep pens, poultry sheds, and pig pens in several reorganized areas to increase local food availability and provide a rural area income source.

In the child nutrition field, UNICEF has aided one-third of the 300 centers for protecting and promoting nutrition. Its primary health care assistance involves providing rural maternity clinic equipment in six regions, village pharmacies in six regions, sanitation in four regions and 95 health posts scattered throughout three regions. Training grants for 920 traditional birth attendants in seven regions, 227 pharmacy managers in four regions, and 17 first aid workers in one region were also provided.

UNICEF's formal education assistance has been directed toward the Center for Advanced Nursing Training (CESSI) in Dakar which trains nurses and midwives. UNICEF has provided training grants, equipment, and transport vehicles.

In the social service area, UNICEF has provided millet grinding mills, millet huskers, rice huskers, palm kernel crushers, and maize huskers in all regions to help lighten rural women's workload. Vaccines and medicines were provided to 60 day-care centers in Casamance.

UNICEF is also helping to alleviate drought effects in the Fleuve region by providing motor pump units to irrigate 2000 ha of Senegal River valley farmlands. In view of this effort's success, the government has expanded this activity into two areas of the

Table VII-4. Projected UNICEF Program of Coooperation, Senegal, 1981-84 (Commitments and Notings)[a]

Probable Annual Call-Forwards ($US 000)

| | 1981 | 1982 | 1983 | 1984 | Total |
|---|---|---|---|---|---|
| Breakdown by Field of Assistance | | | | | |
| Child Health | 229 | 112 | 150 | 150 | 641 |
| Water Supply | 67 | 54 | 54 | 70 | 245 |
| Child Nutrition | 783 | 260 | 120 | 100 | 1263 |
| Social Welfare Services for Children | 901 | 202 | 260 | 150 | 1513 |
| Formal Education | 400 | 450 | 450 | 460 | 1760 |
| Non-Formal Education | 245 | 213 | 240 | 50 | 748 |
| Miscellaneous | -- | 25 | 30 | -- | 55 |
| (urban programs distributed among preceeding headings) | (400) | (440) | (400) | (300) | (1500) |
| Total Proposed UNICEF Assistance | | | | | 6225 |

[a] Actual and projected. Includes requests for supplementary funding.

Source: UNICEF, Country Programme Profile, Senegal, May 8, 1981, E/ICEF/P/L.2072 (REC)

Doue flood plain and Ile a Morhil, and Matam and Bakel. These integrated development activities focus on:

- Providing 30 motor pump units;
- Diversifying agricultural production;
- Providing drinking water supplies;
- Taking measures to protect and promote health; and
- Taking measures to lighten women's workload.

UNICEF is working with SAED to carry out these efforts.

UNDRO

In January 1979 UNDRO was asked to respond with emergency flood assistance to Senegal. UNDRO has estimated over $1 million was given in aid, with the UNDRO's contribution totaling $10,000.

Following an exploratory mission to Senegal in September 1979, technical advisory services were requested in disaster preparedness. As of June 1981, consultant services were still being provided. The purpose was to establish a unified disaster preparedness system arising out of the ad hoc arrangements established at the height of the Sahelian drought. At the time of this writing, no information was available as to the recommendations made and changes instituted in Senegal's disaster preparedness plan and organization.

World Bank

The World Bank has invested quite heavily in capital intensive, infrastructure building projects in Senegal (including road construction, port improvement, railway expansion and maintenance, airport facilities improvement, tourism, and investment promotion. The last quarterly World Bank loan report listed the value of all loans to Senegal from April 1967 to the present at nearly $163 million (original principal). From September 1966, total International Development Association (IDA) credits amounted to over $186 million. The loans and credits reflected in Table VII-5 date from October 1975 and have not yet closed (as of October 1981). These activities represented $278 million in project investments.

The nature of the current IDA investment includes livestock, irrigation and water supply engineering, forestry education, road building, energy, technical assistance in the parapublic sector, and economic and financial planning.

Table VII-5. Proposed World Bank Financed Projects In Mauritania

| Project Name | Government Agency | Description | ($US Millions) Total IDA Commitment | Status |
|---|---|---|---|---|
| Fourth Highway Project | Ministere de l'Equipement | Road maintenance study, pre-investment studies for pavement strengthening, completion of unpaved roads started under Third Highway project. | 3.5[a] | Negotiations tentatively scheduled for July/August. |
| Petroleum Exploration Promotion Project | Ministry of Energy and Mines | n.a. | 2.9 | Negotiations scheduled for June. |
| Education II | Ministere de l'Education Nationale, Ministere de l'Emlpoi et de l'Formation de Cadres, Ministere de la Peche et de l'Economie Maritime. | Strengthening educational planning and administration, training lower secondary school teachers, and vocational training for the fisheries and industrial sectors. | 5.4[b] | Appraisal report being prepared. |
| Technical Assistance to the Rural Sector | n.a. | n.a. | 2.0 | Appraisal scheduled for June. |
| Second Technical Assistance Project for Planning | Ministry of Economy and Finance. | n.a. | 2.9 | Appraisal scheduled for June. |

Source: World Bank Monthly Operational Summary, June 1981, Johns Hopkins University Press, 1981.

[a] Kuwait Fund is financing $5.1 million and Arab Fund for Economic Development, $4.4 million.
[b] Co-financing with AFDB and EEC envisaged.

The Small Rural Operations Project's goal is to encourage local initiatives and thereby broaden popular participation in decisionmaking on rural sector investments. Specific project objectives are to make small groups of producers creditworthy in the local banking system's judgment and strengthen the existing Senegalese capacity for identifying and preparing small rural projects. Increased crop and animal production is an incidental project objective.

Inputs include:

- Construction equipment and technical services for 30 perimeters of 20 ha each for irrigating rice in the Fleuve region's Galenka Valley; 18 perimeters of 2 ha each for irrigating vegetables in Thies and the northern Sine Saloum regions; and 15 perimeters of 4 ha each for irrigating bananas at Sedhiou in the Casamance region;

- Construction, equipment and technical services for beekeeping and honey and wax processing for groups of beekeepers in Bignona in the Casamance region;

- Providing 20 small fishing boats with outboard motors in Louga region;

- Providing equipment for an open well brigade, constructing 50 new wells, and deepening 50 others in Sine Saloum; and

- Providing management structure with the required technical and administrative staff capability to identify, prepare, appraise, and evaluate small rural projects.

This project directly supports rural development agency efforts like those of SAED for irrigation in the Senegal Valley and SOMIVAC for planning and project execution in Casamance.

The Debi-Lampsar Irrigation Project is designed to continue Senegal River delta irrigation development in the two perimeters at Debi and Lampsar to produce paddy and tomatoes. It will also prepare for the whole river valley's future development by strengthening SAED's managerial, planning, and research capabilities. Inputs include constructing and providing agricultural mechanical services, inputs, marketing facilities, and extension srvices for a selected 1100 farmers, and technical assistance and consulting services for SAED in livestock, agro-industries and marketing, feasibility studies, and engineering.

Table VII-6 gives a list of proposed World Bank projects valued at $69 million. Of these proposed projects, the Primary Health Care Project may have the most potential for developing complementary emergency preparedness activities.

Table VII-6. Proposed World Bank Projects In Senegal

| Project Name | Government Agency Involved | Description | ($US Millions) Total IDA or IBRD Commitment | Status as of June 1981 |
|---|---|---|---|---|
| Agricultural Research | Secretariat d'Etat a la Recherche Scientifique et Techniques. | Program of works and technical assistance to improve the national agricultural research system and strengthen the generation and transfer of agricultural technology. | 15.0 (IDA)[a] | Negotiations completed. Preparation studies of $1 million being performed. |
| SOFISEDIT | Societe Financiere Senegalaise pour le Developpement Industriel et Touristique and Societe Nationale d'Etudes et de Promotion Industrielle. | Financial and technical assistance to medium- and small-scale enterprises. | 6.5 (Bank)<br>2.5 (IDA) | Approved by the Executive Directors April 1981. |
| Primary Health Care Project | Not specified. | Components for institution building, drug supplies, intermediate health facilities, information, and education programs. | 15.0 (IDA) | Preparation underway. |
| Dome Flore Appraisal Drilling | Not specified. | Seismic tests and drilling to appraise light oil deposits and collect heavy oil samples; geological work; engineering study to develop light and heavy oil fields; and technical assistance to the Department of Mines. | 5.0 (Bank)[b]<br>5.9 (IDA) | Preparation underway. |
| ICS Railway | Societe d'Exploitation Ferroviaire des ICS (Industries Chimiques du Senegal). | To provide motive power, rolling stock, workshop, and trackworks for ICS railway subsidiary to move phosphate and chemicals to new fertilizer plant to be built near Dakar by ICS. | 19.3 (Bank) | Board presentation scheduled for June 1981. |

UNDP

Very little information was available from UNDP on its country program for Senegal. However, some internal project documents were made available and discussions with the area officer for Senegal have revealed the following selected list of projects presented in Table VII-7.

## CONCLUSIONS

Senegal is in the midst of extensive reforms in the way rural development will take place in the country. This might be a very good time to introduce new concepts, including emergency preparedness, into ongoing and proposed development projects. While AID is attempting to move away from a project-oriented assistance strategy to one of sector support, it will take several years for the program to transform itself substantially. Meanwhile, the following suggestions are offered as potential opportunities for introducing emergency preparedness within the context of ongoing development programs.

- Initiate discussions with USAID/Dakar and Ministry of Health officials to determine the feasibility of introducing an emergency health management plan design into the Rural Health Services Project.

- Initiate discussions with SODEVA to determine ways in which the extension services supported by the Cereals Production Project might be more effectively used to promote emergency preparedness.

- Design a crop and livestock monitoring seminar to introduce these concepts of emergency preparedness to Senegalese students studying in the United States. Under the SODESP Livestock Project and the Cereals Production Project, Phase II.

- Explore ways in which P.L. 480 Title III food might be used to extend credit to farmers after harvest as an incentive to store more grain on the farm, thereby increasing the amount of grain storage in case of deficit, and explore ways in which co-ops can be used to administer this system.

- Explore with USAID/Dakar ways in which emergency preparedness might be introduced in the design of the Rural Health Services II and PVO Sector Grant projects.

- Explore with USAID/Dakar ways that emergency management can be introduced into the project paper of the Rural Management (ENEA) Project.

Table VII-7. Selected UNDP Projects in Senegal (1977-1981)

| Project Name | Executing Agency | Status | Total UNDP Commitment ($US 000) |
|---|---|---|---|
| Fixation des Dunes | FAO | Ongoing | n.a. |
| Developpment de la Peche | FAO | Completed-no extension | n.a. |
| AGRHYMET | WMO | Ongoing | 580,000 (this cycle) |
| Cereals | FAO | Ongoing | 705,000 |
| Planning | Dept. of Technical Cooperation for Development (TCD) | Ongoing | n.a. |
| Territoiral Management | TDC | Ongoing | n.a. |
| Forets de Casamance | FAO | Ongoing | n.a. |
| Gestion et Protection des Eaux Sousterrain | UNDP/OPE | Ongoing and continuing through next cycle. | n.a. |
| SAED Formation | n.a. | Completed | n.a. |
| Statistiques Agricole | FAO | Interrupted, may continue | n.a. |
| Protection de Recolte | UNCDF | New Project | n.a. |
| Construction du Chateau d'Eau | UNCDF | New Project | n.a. |
| Traitement de Semence | FAO | Ended | 20,000 |

Source: UNDP Area office for Senegal, internal UNDP documents.

n.a. not available.

- Determine the nature and scope of UNDRO's proposed recommendations in the revision of the Senegalese national disaster plan and organization, and identify ways in which follow-up activities to implement these recommendations might be undertaken.

- Initiate discussions with the World Bank regarding the proposed Primary Health Care Project and determine if the introduction of emergency health management can be introduced in a feasible way.

## NOTES TO CHAPTER SEVEN

## SENEGAL

1. Arid Lands Information Center, Draft Environmental Report on Senegal, September 1981, p. 4.
2. Ibid, p. 14.
3. OFDA, Disaster History Summary, 1981, printout.
4. Draft Environmental Report, p. 12.
5. AID, Senegal Country Development Strategy Statement FY83, January 1981, p. 29.
6. Ibid, p. 15.
7. Ibid, p. 52.
8. Ibid, p. 8.
9. Draft Environmental Report, p. 149.
10. OFDA, Senegal, A Country Profile, 1979, p. 10.
11. AID, FY'83 Annual Budget Submission, June 1981.
12. Ibid.

# CHAPTER EIGHT

# UPPER VOLTA

Upper Volta is a landlocked country lying in three ecoclimatic zones ranging between the Sahelian steppe with its 400 mm of annual rainfall in the extreme northeast, the Sudanian wooded savannah in the central plateau (650 to 900 mm annual rainfall), and a Guinean light forest of up to 1400 mm average annual rainfall in the extreme southwest. There is considerable rainfall fluctuation within rainfall sectors, and drought conditions can and do occur in some areas even during adequate rainfall seasons.

Upper Volta is one of the Sahel's most populous countries with 6.2 million people. It has a mostly traditional rural economy with an average per capita GNP of $110. Upper Volta has a relatively high population density: about two-thirds of its population lives on less than one-third of the land area. Approximately 90 percent of the population relies on agriculture for its existence.

## DISASTERS IN UPPER VOLTA

Droughts and epidemics have struck Upper Volta during the last 15 years. Food shortages due to drought have necessitated international disaster relief during nine of those years. Droughts lasting for long periods are quite common historically. During the last 15 years, droughts occurred in 1966, 1968-73, 1975, and 1977-78. The most recent drought disaster requiring U.S. aid was in 1978 when almost half a million people were afflicted in the country's central region. Over $8 million in assistance was given[1].

Epidemic is the second most common form of Voltaic disaster requiring international assistance. Meningitis, measles, and yellow fever cause the most virulent problems requiring U.S. aid. The most recent epidemic ocurred in 1981 when meningitis struck Upper Volta's Sahelian zones, killing 52 and afflicting more than 300 others. U.S. assistance totaled almost $100,000. Onchocerciasis is also a serious problem, preventing the settlement of substantial areas of protentially productive land along the Volta River.

## Drought and Food Production

Since drought is the leading cause of disaster in Upper Volta, it is important to understand the country's general agricultural situation. Upper Volta's agricultural economy is typical of the region. Millet and sorghum are the main staples, supplemented by small amounts of rice and maize. The farming sector is overwhelmingly subsistence-oriented. The Mossi plateau, the area where 3.5 million of the country's population resides, is handicapped by poor, shallow soils, erratic rainfall, and a long dry season. Nevertheless, developing Upper Volta's agricultural base is the only major, long-term development course open since there are no other significant alternatives.

The agricultural sector's growth has declined the last few years due partly to the substantial Sahelian drought-caused production setback. Major food production problems persist, characterized by: low or stagnant production failing to match population growth; highly variable yields due to erratic rainfall; low productivity; and population pressures leading to overexploited land resources.

Upper Volta is divided into 11 regional development organizations (ORDs) for agricultural administration purposes. Four are typically deficit areas: that is, they import grain. These regions are supplied by southern and western ORDs which export grain to northern Upper Volta and coastal countries further south. In 1975 an estimated 30,000 tons of grain were exported to neighboring countries. Figure 1 depicts inter-regional grain movements and the estimated volume of regional consumption.

Upper Volta has certain advantages in its drive to reach food self-sufficiency. It is relatively favored, ecologically speaking, being mainly Sudanese rather than Sahelian in climate and vegetation. There are substantial areas of unsettled and unused land in the southwest and especially along the Volta Rivers. There lands, lying in good rainfall could be highly productive. Settlement, however, has been restricted by health hazards. Upper Volta is the least urbanized of the Sahelian countries, and, like Mali, appears to have real potential for a future grain exporting role. The primary constraint to increasing Upper Volta's food security, as a preparedness measure against drought-produced food shortages, is not expanding production but providing marketing and storage. This problem is discussed more fully in a later section of this chapter.

## Epidemics and Development

Voltaic health conditions are among the world's worst. Malnutrition is widespread, preventable diseases common, and a wide variety of parasitic diseases endemic to the area. Life expectancy is 32 years in a rural environment and 38 in urban areas.

République de Haute-Volta

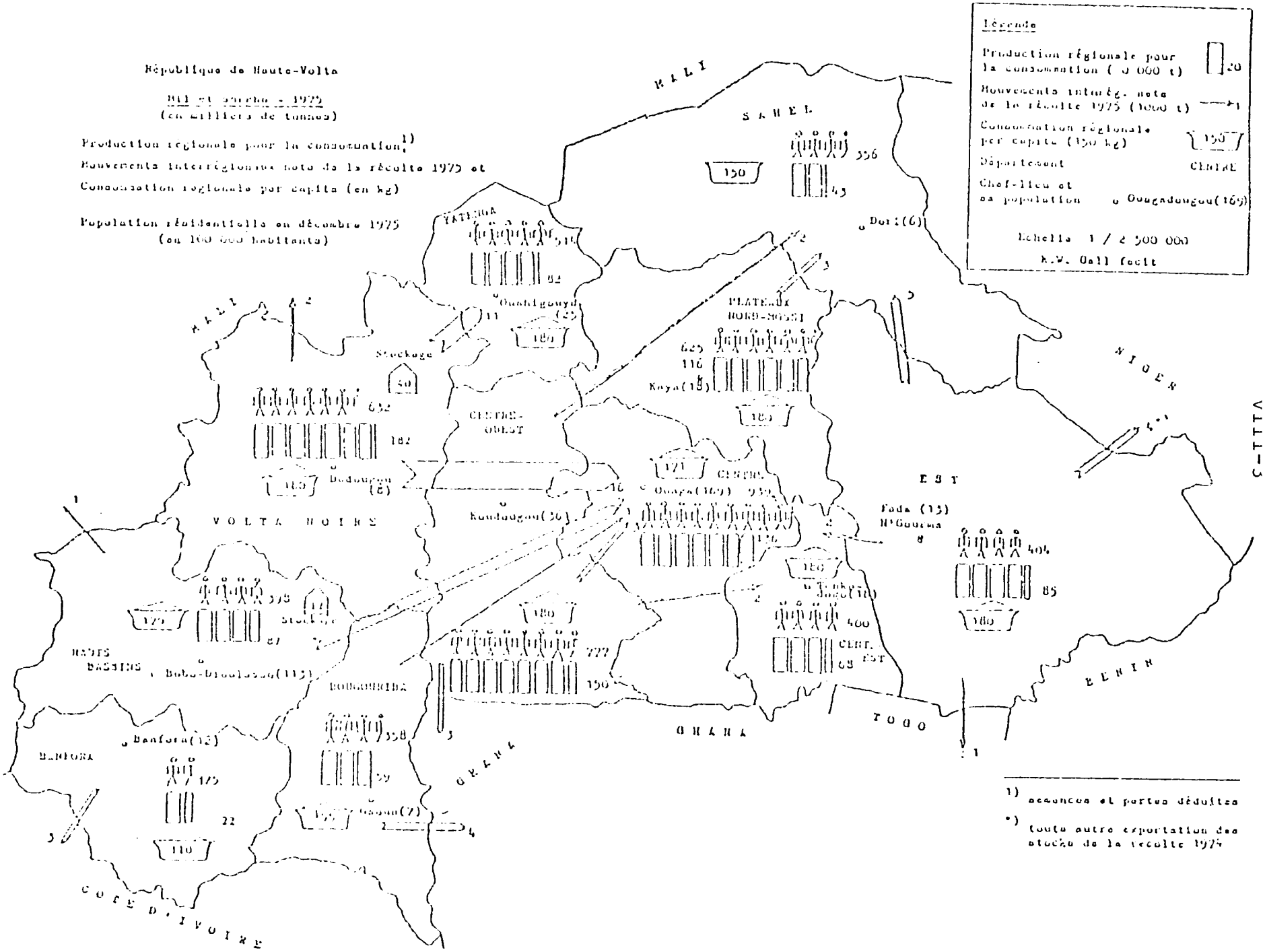
Bilan céréalier - 1975
(en milliers de tonnes)

Production régionale pour la consommation[1)]

Mouvements interrégionaux nets de la récolte 1975 et

Consommation régionale par capita (en kg)

Population résidentielle en décembre 1975
(en 100 000 habitants)




1) acquisitions et pertes déduites

*) toute autre exportation des stocks de la récolte 1974

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## Surface Moyenne Par Exploitation, 1972
## Average Acreage Per Farm Unit, 1972

(Hectares et %)

| REGIONS (ORDS) | TOTAL SURFACE | MIL-MILLET ha | MIL-MILLET % | SORGHO-SORGHUM ha | SORGHO-SORGHUM % | MAIS-MAIZE ha | MAIS-MAIZE % | RIZ-RICE ha | RIZ-RICE % | COTON-COTTON ha | COTON-COTTON % | ARACHIDE GROUNDNUTS ha | ARACHIDE GROUNDNUTS % | SESAME ha | SESAME % | AUTRES OTHERS ha | AUTRES OTHERS % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) SAHEL | 6.0 | 2.6 | (43) | 1.6 | (27) | .36 | (6) | | | | | .75 | (12) | .48 | (8) | .21 | (4) |
| (2) OUAHIGOUYA | 3.4 | 1.2 | (35.3) | 1.8 | (.53) | .005 | (.1) | .005 | (.1) | .030 | (.8) | .150 | (4.4) | .050 | (1.5) | .361 | (4.8) |
| (3) KAYA | 4.4 | 1.17 | (26.8) | 1.95 | (44.2) | .12 | (2.7) | .03 | (.6) | .25 | (5.4) | .3 | (7.0) | .05 | (1.1) | .53 | (12.2) |
| (4) KOUPÉLA | 4.0 | 1.9 | (48.9) | .08 | (20.7) | .13 | (3.47) | .33 | (8.56) | .026 | (.68) | .56 | (4.45) | | | .275 | (3.1 |
| (5) FADA | 6.6 | 1.48 | (22) | 2.95 | (45) | .42 | (6) | .45 | (7) | .30 | (5) | .77 | (12) | | | .24 | (3) |
| (6) OUAGADOUGOU | 4.0 | 3.64 | (91) | | | | | .02 | (.5) | .09 | (2.2) | .15 | (3.8) | | | .10 | (2.5) |
| (7) KOUDOUGOU | 4.2 | (-----3.8----- | | (89.8)---------- | | | | ) .03 | (.7) | .17 | (4.7) | .1 | (2.4) | (------.1---- | | (2.4)------ | |
| (8) DÉDOUGOU | 4.5 | 1.49 | (32.8) | 2.08 | (45.9) | .13 | (3) | .03 | (.7) | .33 | (7.2) | .21 | (4.7) | .1 | ( 2.1) | .16 | (3.6) |
| (9) BOBO-DIOULASSO | 6.0 | 1.26 | (21) | 2.46 | (41) | .3 | (5) | .12 | (2) | .72 | (12) | .42 | (7) | .12 | (2) | .6 | (10) |
| (10) BOUGOURIBA | 5.0 | 1.9 | (38) | 1.8 | (36) | .3 | (6) | .1 | (2) | .113 | (2.26) | .45 | (9) | .025 | (.5) | .312 | (6.24 |
| (11) BANFORA | 7.5 | (---------4--- | | (53)---------- | | | | ) .5 | (7) | | | 1.2 | (16) | .7 | (9) | 1.1 | (15) |

SOURCE: Gare et Storm, Rapport de la Commission Mixte OFNACER/DDR, Enquête sur la production et la commercialisation des céréales, (ronéo) août 1972.

The infant mortality rate is 182 per 1000 live births and child mortality rate 245 per 1000. An estimated half of all children die before age five[2]. While few reliable health statistics are available for Upper Volta, it is evident that preventable infectious diseases including measles, pertussis, poliomyelitis, tuberculosis, tetanus, and meningitis kill or leave permanently disabled and dependent tens of thousands of Voltaic children each year. Gastroenteritis, amoebiasis, and intestinal worms debilitate and kill thousands more through diarrhea and dehydration. Other parasitic diseases, including malaria, onchocerciais, and schistosomiasis, are endemic and take their toll in human suffering.

The Voltaic health infrastructure is weak even by Sahelian standards. The current health delivery system focuses on facility-based, physician-oriented care with severely limited access for most rural Voltaics. The drain on limited financial resources to maintain this low level of service is so great that health care system expansion is not possible given present financial resources.

The implications of the country's physical characteristics for health are numerous. Unpredictable rainfall and mediocre soils clearly play a part in the relatively low and variable agricultural production levels, that contribute to malnutrition. Scarce water resources encourage the use of easily accessible but often contaminated water catchment areas as drinking water sources, contributing to gastroenteric diseases.

Upper Volta's geography also produces an ideal environment for many types of diseases. Voltaic rivers are breeding sites for the black fly that transmits onchocerciasis (river blindness): some of Upper Volta's most fertile valleys are depopulated as a result. Malaria is transmitted by the anopheles mosquito which breeds in the stagnant ponds and rivers abounding during the wet season. The country's savannah area provides excellent breeding grounds for the tse tse fly which transmits trypsanosomiasis (sleeping sickness).

The dry season, while reducing certain disease-causing populations, contributes to other problems. Among them is the fog-like dust hanging over the country during harmattan which irritates the upper respiratory tract and eyes and contributes to the spread of meningitis.

## DISASTER PREPAREDNESS IN UPPER VOLTA

In 1972 a presidential decree established a national-level organization, the Sous-Comite Permanent de Lutte contre des Effets de la Secheresse, in response to large-scale external assistance to drought victims. The Sous-Comite became a permanent drought and famine relief organization whose primary function was to provide the administrative, financial, and operational infrastructure for large-scale food distribution.

The ORDs distribute disaster relief (food) in Upper Volta as well as provide varying degrees of administrative and labor support. In the late 1970s, the Government of Upper Volta (GOUV) made significant internal reorganizations to help improve its ability to manage emergency grain shipments within the "normal" marketing, storage, and food grain distribution systems. The Sous-Comite was disbanded and its operations assumed by OFNACER, the National Cereals Office[3].

The government created OFNACER in 1971 and designed it to protect consumers against excessive retail grain price fluctuations and provide a support price farmers. It was also established to create a regional grain storage capacity and build buffer stocks as security against drought and food shortages.

OFNACER has never been able to market more than a small share of domestically produced grain since its creation. There are many reasons for OFNACER's restricted grain market presence. The drought forced its efforts and attention toward the problem of grain distribution in deficit areas. Its staff is small and, until recently, its storage capacity limited. It has little working capital and runs sizeable deficits since it has been forced to sell grain to consumers below cost.

There is little documentation available to identify how external donors have interacted with OFNACER officials during recent drought relief programs. Therefore, its performance is difficult to assess. The Sous-Comite's grain operations and facilities were turned over to the ORDs and OFNACER. Near-normal (but still deficit) harvests have allowed OFNACER to shift its concentration from expediting emergency food shipments to improving its operational efficiency.

OFDA's country profile on Upper Volta includes information on the voluntary agencies and international organizations working there. This study does not assess various donors and governmental agencies' incountry capacity to manage relief operations. However, several disaster relief and preparedness system weaknesses can be noted:

- Lack of adequate rural area storage capacity;
- Poor data collection and analysis techniques for monitoring crop growing conditions and production;
- Lack of a system for monitoring production and consumption prospects outside Upper Volta;
- Lack of a system to analyze grain inventory shipments and receive information from the ORD regional warehouses;
- Inadequate system of tabulating and distributing weather data for grain storage management;
- Lack of trained mid- and upper-level ORD managers and technicians sensitive to developing a disaster preparedness system;
- Lack of a Ministry of Health (MOH) administrative system or planning capacity to anticipate health emergencies;
- Lack of trained health personnel;
- Lack of health and nutritional monitoring and surveillance systems to provide early warning of health emergencies; and
- Inadequate systems regarding logistics, supply management, statistical analysis and health data collection, information flow, and management system standardization.

These weaknesses will be further discussed within the context of specific ongoing or proposed projects designed to alleviate them.

## AID DEVELOPMENT ASSISTANCE TO UPPER VOLTA

In FY82 AID obligated approximately $18.3 million for development projects in Upper Volta. U.S. development assistance in FY83 will reach $20 million[4].

As noted in the CDSS, AID's Voltaic assistance strategy centers on four areas of development priority. The first two are increasing food production and enhancing the natural resource base's productive capacity.

AID's strategy is aimed at increasing food production through improving agricultural inputs and farming system techniques as well as supporting a variety of production-related activities. The AID agricultural assistance strategy is sensitive to frequent

recurrences of localized drought and crop failures in an unpredictable pattern throughout scattered rural areas of Upper Volta. In response to this, AID is supporting projects to reduce the potential suffering by food deficit-area populations. This is done by promoting agricultural production and improving marketing, storage, and distribution systems.

Upper Volta's environmental challenge is immense. While it confronts a wide variety of environmental difficulties, three related problems stand out as requiring rapid and effective intervention. These are deforestation, range land deterioration, and declining soil fertility. Wood consumption (which supplies 94 percent of Upper Volta's energy needs) now exceeds annual forest resource production. Given current usage rates, forest resources will disapper within 20 years. Deforestation from clearing, fuelwood harvesting, and overgrazing is already apparent in many areas and leads to significant erosion and declining soil fertility. In heavily populated regions up to one-fourth of previously forested land has already been lost to crop and livestock production. Without implementing a major and comprehensive land and forest management program in the near future, environmental degradation will irrevocably preclude fulfillment of Upper Volta's food and energy needs.

The proposed AID Environmental Sector Program is designed to deal with these problems. This project has grown out of the AID mission's experience over the last several years in forestry eduation, village woodlot development, experimentation with woodstoves to conserve fuel, village livestock development, and a variety of agricultural production efforts. Upper Volta has also been the site of several environmentally related workshops, seminars, and studies. Major AID-funded activities in the environmental sector include the Forestry Education and Development Project which trains lower- and middle-level forestry agents and manages the Dinderosso forest reserve; the Agriculture Human Resources Development Project which provides higher-level foresty training at the National Polytechnical Institute; and three A.I.P.s that the Ministry of Environment and Tourism and the Peace Corps are implementing. In addition, the Village Livestock Development Project studies means of expanding livestock production while maintaining range land integrity.

AID's third priority is population- and health-related activities. AID efforts to support the MOH planning capacity will help improve GOUV efforts to manage health emergencies and external assistance more effectively. AID health sector strategy is to provide national level assistance in order to lay the groundwork for implementing a rural health delivery system.

The fourth priority also concerns one of the most serious constraints to Voltaic economic development: the lack of properly trained and motivated personnel. One of AID's programs, the

Table VIII-1. Selected Ongoing and Proposed AID-Supported Projects in Upper Volta

| Project Name and Number 686-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Project Cost Total LOP Authorization ($US 000) |
|---|---|---|---|---|---|---|
| Strengthening Women's Roles in Development (SWID) 0211 | To improve rural women's capacity to organize, manage, and invest in social and economic development projects, and institutionalize credit. | 77 | 81 | -- | -- | 667 |
| Agricultural Human Resources Development 0221 | To improve agricultural training and research facilities, train professional agriculturalists to staff GOUV agricultural services including ORD extension systems, and provide a reservoir of trained personnel for developing agricultural enterprises. | 78 | 83 | 3,457 | -- | 9,457 |
| Training Women in the Sahel (TWIS) 0226 | To train Sahel ORD-based female extension agents and female village professionals to work with Sahelian women in organizing, financing, and managing labor-saving technologies, income-generating activities, health and hygiene programs, and local language literacy through credit and self-help. | 78 | 83 | 517 | -- | 1,700 |
| Rural Water Supply 0228 | To provide rural people of southwest Upper Volta with potable water meeting minimal daily requirements, and provide effective preventative health education to maximize improved water system benefits. | 79 | 84 | 4,003 | n.a. | 12,280 |
| Sequenega IRD (OPG) 0231 | To achieve improved social services, production opportunities and support services in the Sequenega sector of Yatenga ORD. | 78 | 83 | 1,600 | -- | 4,956 |
| Forestry Education & Development 0235 | To increase GOUV capability to provide rational land and water use through anti-desertification programs such as reforestation, soil conservation, forestation, and forest and wildlife management. | 79 | 84 | --- | -- | 5,958 |
| Grain Marketing Development 0243 | To increase rural area food security and avoid extreme price peaks or depressions in local grain markets, and maintain maximum private grain marketing participation. | 80 | 83 | 1,481 | -- | 2,381 |

Table VIII-1, (Continued)

| Project Name and Number 686-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Project Cost Total LOP Authorization ($US 000) |
|---|---|---|---|---|---|---|
| Eastern Region Food Production 0244 | To increase GOUV capacity to manage food production in the Eastern ORD. Capital assistance provided by other donors. | 81 | 85 | 1,000 | n.a. | 3,000[a] |
| Foundation Seed Production 0245 | To improve GOUV ability to supply adapted high-quality food crop seeds to small farmers at competitive prices by improving National Seed Service capacity to plan and control seed production. | 81 | 84 | --- | n.a. | 1,100 |
| Rural Roads II 0247 | To increase small farmer access to markets, and villagers to health and education services and increase the Eastern ORD's management effectiveness through access to remote areas under its jurisdiction. | 82 | 85 | 3,500 | 2,450 | 5,950[a] |
| Small Economic Activity Development (OPG) 0249 | To increase Eastern ORD small economic activity, provide credit to small entrepreneurs unable to obtain credit elsewhere, and help give technical assistance, training, and equipment to small farmers. | 81 | 85 | -- | 500 | 2,150[a] |
| Strengthening the Voluntary Sector 0250 | To support private and voluntary organizations and the Peace Corps to improve the rural life quality. | 82 | 85 | 1,000 | 1,300 | 2,300[a] |
| Rural Health Planning 0251 | To develop MOH planning capability to provide better and more extensive health coverage with limited financial resources. | 82 | 88 | 1,700 | 1,800 | 2,500[a] |
| Technical Skill Management 0253 | To improve technical and administrative direction of development projects and programs. | 82 | 87 | 2,000 | 4,500 | 10,000[a] |
| Agricultural Sector 0255 | To develop agricultural production potential to achieve food self-sufficiency, increase farmer incomes, and eliminate constraints preventing capital returns to public and private sectoral investment (GOUV and donor). | 83 | 88 | -- | 6,000 | 60,000[a] |
| Environmental Sector 0256 | To develop capability to protect and rehabilitate environment, increase area and density of rural area vegetative cover, control soil erosion and declining soil fertility, and expand national forests' sustained yield management. | 83 | 88 | -- | 3,450 | 25,000[a] |

Table VIII-1, (Continued)

| Project Name and Number 686-- | Description | FY of Initial Funding | Project Completion Year | Project Cost FY 82 OBL ($US 000) | Project Cost FY 83 AAPL ($US 000) | Total LOP Authorization |
|---|---|---|---|---|---|---|
| Dori IRD Phase II (OPG) 0248 | To develop the capacity of people in selected Sahel ORD communities to identify their own development needs and design and implement community-based projects. | 82 | 85 | 400 | -- | 400 |
| Yako Revegetation & Environmental (OPG) 0254 | To develop a regionally-oriented, village-based re-vegetation and natural resource conservation system by developing an integrated forestry extension service for Yako Canton rural villagers. | 82 | 85 | 1,025 | -- | 1,025 |

[a] Planned Obligation

Sources: FY82 Congressional Presentation; Annual Budget Submission FY83, Upper Volta; and USAID/Ouagadougou Briefing Book, September 1980.

NOTE: Does not include regional Sahel Development Program Projects.

Table VIII-2. Selected AID-Supported Projects and Associated Preparedness Needs[a]

| Project Title and Number 686-- | Primary AID-Supported Components | Potential Preparedness Activity |
|---|---|---|
| Agricultural Human Resources Development 0221 | Construction<br>Additional education facilities, equipment, transportation, and support.<br>Technical Assistance<br>Replacements for Voltaic professors receiving additional training.<br>Training<br>Local and outside Upper Volta for professors to expand curriculum at three agricultural training centers. | Educational Development<br>Strengthen practical training component by developing food emergency simulation exercises. |
| Forestry Education and Development 0235 | Construction<br>Training center for junior-level forestry extension agents.<br>Technical assistance<br>Developing and executing a model forest management plan for the Dinderosso forest.<br>Training<br>Forestry students at Dinderosso training center to work at village-level. | This is a human resource development project to prevent further Voltaic deforestation. Only marginal disaster preparedness opportunities currently exist within this project. |
| Grain Marketing Development 0243 | Construction<br>10 small grain storage facilities in rural areas (sub-prefectures or rural arrondissements).<br>Revolving fund<br>To finance the anual purchase of 10,000 mt of local grain.<br>Technical assistance<br>Economist and agricultural economist to work with Voltaic counterparts in OFNACER to select storage sites.<br>Training<br>Kansas State University grain marketing and storage course and other third country training.<br>Support<br>Vehicles and management information specialist to work in OFNACER to improve reporting and accounting procedures. | Training<br>To institute a cooperative agreement with Kansas State University to undertake a joint seminar on managing food security stocks as a preparedness measure against drought and other food emergencies. |

Table VIII-2. (continued)

| Project Title and Number 686-- | Primary AID-Supported Components | Potential Preparedness Activity |
|---|---|---|
| Eastern Region Food Production 0244 | Training<br>Short- and long-term, local and outside Upper Volta.<br>Monitoring and evaluation<br>Short- and long-term technical assistance to create and staff a Monitoring and Evaluation Unit (MEU) within the project.<br>Research<br>Special applied studies. | Training<br>To initiate discussions with PAID about instituting emergency management as part of its short-term training in project management and rural development social science skills. This could also be instituted within its new long-term regional planning course.<br><br>To initiate discussions with the University of Pittsburgh to hold a joint seminar on emergency management skills within the context of their annual project management course. |
| Small Economic Activity Development (OPG) 0249 | Technical assistance<br>To help people enganged in small enterprises plan and develop activities.<br>Credit fund<br>To help develop small-scale enterprise activities.<br>Institution-building<br>Developing an indigenous private voluntary organization to promote and finance small-scale enterprise activity. | There is no obvious disaster preparedness opportunity currently within this project. |
| Rural Health Planning 0251 | Technical assistance<br>Establishing a Health Ministry Planning Office responsible for sector analysis and planning, system development, project development, and national planning.<br>Construction<br>Equipment and supplies.<br><br>Counterpart training<br>Short- and medium-term (6 mos.-2 yrs) for the small Planning Office staff in Africa. | Hazard/Vulnerablilty analysis<br>Evaluate health monitoring and surveilance system and identify geographic areas vulnerable to epidemic.<br>Technical assistance<br>Improve the Health Ministry's emergency preparedness capacity. Improve recordkeeping and management of emergency assistance. Evaluate preparedness needs and make further proposals for action. |

[a] Excluding capital-intensive projects such as roads, catchments, warehouses, docks, jeeps, afforestation, and so on.

Sources: Project papers and project identification documents.

Current Projects

Current AID-supported projects with preparedness opportunities can be grouped in the following categories:

- Training disaster managers and technicians;
- Resource analysis;
- Contingency planning; and
- Hazard/vulnerability analysis.

Training Disaster Managers and Technicians

Within this area, there are three AID-supported projects offering potential opportunities. They are:

- Agricultural Human Resources Development Project. One project objective is to expand the curriculum for training agricultural extension agents at local indigenous institutions.
- Grain Marketing Development Project. One project objective is to offer short-term U.S. training for 15 OFNACER employees.
- Eastern Project Food Production. One project objective is to offer nine different training components, long- and short-term, local and outside Upper Volta, for ORD and MRD officials at different levels.

While there are other projects with training components, the nature of the training either involves too few participants (Rural Health Planning) or is focused on village-level health workers primarily responsible for public education (Rural Water Supply), and therefore may be less appropriate for direct OFDA support.

The Agricultural Human Resources Development Project which began implementation in 1979, emphasizes both in-country training and implementing a curriculum relevant to Voltaic agricultural needs. By increasing the practical training available to mid- and upper-levels of the agricultural extension network, the project will expand the GOUV's capacity to prepare these agents more effectively to work with the encadreurs who work directly with the rural population.

Disaster preparedness can have a positive role in agricultural education by introducing new teaching tools that increase agricultural technicians' capacity to perceive slowly developing drought hazards. This increased perception could help

the MRD obtain better data on crop conditions, rainfall crop yields, pest infestation, disease, and so forth. This directly relates to improving the MRD's capacity to predict food shortages and provide an early warning system for emergency situations requiring external assistance.

The Agricultural Human Resources Development Project provides a potential opportunity to develop and test a drought emergency simulation teaching tool which could be used both in the classroom and as a field training exercise. This simulation could reproduce slowly developing food shortage conditions and test student responses to that situation. It could also provide an opportunity to involve an indigenous institution with an impact beyond the initial visit.

Instruction could be targeted at the Category A level of agricultural technician, the Ingenieur de Developpement Rural, at the top echelon of the MRD agricultural service. These agricultural technicians are university graduates trained in foreign countries. Under the Agricultural Human Resources Project, students studying for this degree will receive four to five years of instruction at the Institut Superieur Polytechnique at the University of Ouagadougou. Training could be introduced as a two-week guest lecture series, provided professors are trained in using the simulation tool so its continued use is ensured. Since this project is well into implementation, a follow-on phase might provide a better opportunity to introduce a new activity. The project aims to produce 105 ingenieurs through 1983 (25 in 1983), many to work in the MRD of other agencies upon graduation. Some will also be sent to the ORDs. An appropriate time to introduce this simulation might be in the second cycle, third year of instruction, when students are required to take agricultural geography and the environment. A more detailed curriculum examination might reveal other opportunities.

Before designing this teaching method or other materials to improve drought preparedness, the likely relevance of such a simulation for the upper levels of Voltaic agricultural personnel should be studied, given their likely MRD responsibilities. This would entail studying the MRD system of detecting food emergencies and the role extension agents play in data collection and analysis.

Within the Grain Marketing Development Project which commenced last year, there may be an opportunity to conduct some joint training activities with Kansas State University's grain marketing and storage course. In the past, course material has been rather theoretical, and while field trips offer the opportunity to see sophisticated agro-industrial storage and research facilities, it is sometimes questionable how relevant this is. Perhaps a series of lectures on emergency management techniques regarding grain security stocks as a preparedness measure against

food emergencies might offer OFDA the opportunity to introduce a practical learning experience into the curriculum. The university course lasts six weeks, is held every summer, and usually has 30 or more students from several different countries. Under the Grain Marketing Development Project, 15 OFNACER employees are being sponsored.

The Eastern Region Food Production Project, which started implementation in 1981, offers training aimed primarily at the mid- and upper-level ORD official and central MRD official responsible for ORD management. Two of its components use the University of Pittsburgh and the Pan African Institute for Development (PAID) as training institutions.

One preparedness possibility might be to investigate PAID's willingness to introduce an emergency management course as part of its short-term training program in project management and rural development. PAID, an indigenous African training institution, has been substantially AID-funded for 20 years. PAID has opened a new center in Ouagadougou (the other three African offices are in Cameroon) with 10 professional trainers (six African, four European). The Institute offers short-term project management and rural development social science skills training courses upon request to francophone countries within the Sahelian West African region and responds to requests for tailor-made training programs.

In addition to PAID's capacity to run short-term training sessions in the ORDs as part of this project, PAID is instituting its first long-term training program. This three-year course in regional planning will be located in Ouagadougou, but will include substantial field experience. Both the short- and long-term training this capable institution offers may provide an opportunity for introducing emergency management. Because of the continuous state of one or another Sahelian emergency, it would not appear too difficult to approach PAID with a justification for expanding their present courses' scope. This proposal supports the idea of using indigenous organization facilities to follow up on a continuous basis and ensure greater host participation for other OFDA-supported training.

OFDA might also investigate the possiblity of holding an annual French-taught joint seminar with the University of Pittsburgh as part of its project management course. This would provide an excellent opportunity at relatively low cost to institute disaster preparedness training. The project sponsors students to attend this course.

## Resource Analysis, Contingency Planning and Hazard Vulnerability Analysis

Opporunities for introducing resource analysis, contingency planning for emergencies, and hazard/vulnerability analysis present themselves in the following disucssion of proposed projects.

### Proposed Projects

Table VIII-3 illustrates the schedule of proposed FY82 and FY83 Voltaic project design activities. Of the projects progressing past the PID stage at this writing, the Rural Health Planning and Management Project offers three kinds of disaster preparedness opportunities which could be introduced into the project design scheduled for January 1982. These include hazard/vulnerability analysis, resource analysis, and contingency planning.

The project's purpose is to develop a MOH planning capability enabling it to provide better and more extensive health care with limited financial resources. This will involve putting into place the necessary trained personnel and administrative systems to make the recently created but not yet operational MOH Planning Office a viable and functional unit. This office is designed to have the capacity to develop and effectively guide the expansion of Upper Volta's health care to rural areas. Making the Planning Office operational will entail training five MOH personnel in health planning, statistics and financial analysis, rural health program development, record system development, and public health administration. In addition, the project will construct and equip a building for the Planning Office and provide a portion of its operational costs during the project's life.

Implementing the project will require creating 13 positions --five professional and eight support staff. The AID-provided technical assistance team will produce a variety of sector analyses, systems development, project development, sectoral planning, and national planning documents for MOH and donor use.

AID will provide 12-person years of long-term and 30-person months of short-term assistance. The long-term technical assistance will consist of four technicians working with Planning Office counterparts (physicians, health statisticians, administrative/logistics specialists, and public health nurses). Funds have been reserved for short-term technical assistance in fields such as health economics, training, financial management, and special public health concerns.

Table VIII-3. FY82 Proposed Project Design Schedule for AID Projects in Upper Volta.

| Project Title and Number 686-- | PID Completion Date | PP Preparation Date |
|---|---|---|
| Dori IRD Phase II OPG-SCF/CDP 0248 | N.A. | N.A. Review scheduled February-March 1982 |
| Strengthening Voluntary Development 0250 | Aug. 1981[a] | February 1982 |
| Rural Health Planning and Management 0251 | July 1981 | January 1982 |
| Management and Technical Skills 0253 | February 1981 | April-May 1982 |
| Yako Revegetation and Environmental Management (OPG) 0254 | N.A. | N.A. Review scheduled February-March 1982 |
| Agricultural Sector Program 0255 | December 1981 | June 1982 |
| Environmental Sector Program 0256 | December 1981 | July-August 1982 |
| Rural Roads II | April 1981 | January 1982 |

[a] PID not approved. May become a "shelf" project.

Source: Annual Budget Submission FY83, Upper Volta and AID/W interviews with the Desk Officer, Upper Volta.

This project potentially offers the ideal timing and newly created institutional setting to begin a program of health emergency preparedness. This activity, accomplished through short-term temporary duties (TDYs) scheduled at intervals throughout the project's life, might introduce preparedness in the following ways:

- Hazard/Vulnerability Analysis:
  What is the precise nature of the problem?
  Where are health emergencies most likely to occur?
  When is the most vulnerable time of year and under what weather conditions?
  What implications does that have for resource allocation?

- Resource Analysis:
  What is the present MOH capacity for delivering health emergency assistance (perception, early warning, planning, distribution of supplies, monitoring and surveillance, follow-up care, and so forth).
  What implications does this have for proposals to improve the system?

- Contingency Planning:
  Given present, or near-future resources, what arrangements (administrative, logistical, ordering of supplies, stock-piling, distribution, personnel, information systems, and so forth) can be made to improve MOH performance?

Getting involved at the project design stage is also a good opportunity to introduce preparedness planning. A three-year involvement in periodic technical assistance to the same project allows a preparedness system to develop and be put into practice as well as be monitored. Since Upper Volta has such a lack of good data on rural area health conditions, it should not be difficult to justify the need for a hazard/vulnerability analysis. A resource analysis for health emergencies may share common objectives with a survey of general MOH resources, but has a very different purpose and potentially different solutions to needs and problems. The need for a resource analysis from the health emergency viewpoint is an activity which could clearly be integrated into the project scope and objectives. Since Upper Volta has experienced numerous health emergencies during the past 15 years, there is a clear need for contingency planning. Given the past history of these events' frequency, it should be possible to see a health preparedness system designed within the project's context and tested and evaluated in a health emergency during the project's life or during some extended period of assistance.

Of the other proposed AID projects in Upper Volta, PID documents are now being prepared for agricultural and environmental sector programs that also offer potential preparedness opportunities. The currently delayed Management and Technical Skills Project might also provide interesting opportunities and should be explored further.

## P.L. 480 Program

The P.L. 480 program in Upper Volta is carried out in collaboration with Catholic Relief Services (CRS) and through a government-to-government program with OFNACER under the Grain Marketing Development Project. Both programs come under the Title II program. OFNACER storage and market intervention problems are being partly addressed by selling P.L. 480 Title II commodities to generate local currency to finance warehouse construction and buy locally-grown cereals.

The CRS Upper Volta program is the largest P.L. 480 Title II program in Africa. Program areas include Maternal Child Health (MCH), a food and nutrition program for children in primary schools, a program of young farmer training schools (CPJA), as well as Food for Work and Welfare Assistance.

In FY82 the USAID mission will continue to support feeding an increased number of primary school recipients, but will probably eliminate the summer take-home ration. The MCH program will be expanded only 5 percent. Title II support for the Food for Work program will be cut 50 percent from FY81 levels with further reductions or possibly total elimination by FY83. The mission will also eliminate Title II support for the Young Farmer Training schools feeding program. Mission figures for the FY83 P.L. 480 program in collaboration with CRS totals $354,000[4].

## Other Donor-Assisted Projects

The United Nations organizations and World Bank have also been actively promoting Upper Volta's development programs to help increase capacity to deal with future emergencies such as drought and epidemic. Their activities are briefly reviewed in the following discussion.

### UNDRO

UNDRO has supported regional and global preparedness activities. Although not directed specifically at Upper Volta, they may, by inference, be of some benefit to the GOUV. Since April 1977, UNDRO has been involved in one emergency in Upper Volta and undertaken one disaster preparedness activity.

In October 1977 the GOUV asked for assistance after torrential rains destroyed drinking water reservoirs, damaged other reservoirs' dams, and left 900 people homeless. UNDRO arranged for WFP to divert food already in Upper Volta for other

projects to pay local labor repairing the reservoirs. This small scheme, supplemented by a $17,000 UNDRO grant for purchasing cement and other building materials, fulfilled these rain-caused primary needs.

In January 1978 the national director (designate) of Upper Volta's civil defense began a six-month training program with the Securite Civile in France. UNDRO also covered the costs of this course.

The problem of rain-damaged reservoirs may warrant further investigation. Given increased Voltaic investment in water resource development, this problem may become more serious and widespread in the future. Discussions could be initiated with AID mission and GOUV officials to determine its extent and what activities, if any, could be taken to prevent future damage.

UNICEF

UNICEF's Voltaic activities include basic health services, maternal and child welfare, environmental sanitation, prevention and elimination of communicable diseases, and education and nutritional surveillance. Over $5.3 million in assistance is projected for 1981-83.

An average of $40,000 per year was spent in emergency relief to Upper Volta during 1975-79. In 1979, UNICEF provided vaccines to halt a cerebro-spinal meningitis epidemic. No emergency relief was provided in 1980 and only $5,000 annually is budgeted for 1981 and 1982. The program of activity for 1981-84 is presented in Table VIII-4.

In health and nutrition areas, UNICEF typically provides rural health centers in east-central and north-central Upper Volta with drugs, equipment, and transportation. Vaccine and drugs to control and treat malaria, measles, tuberculosis, trachoma, leprosy, and poliomyelitis are given to support the national immunization program.

UNICEF-supported social service activities include training young agricultural and social workers in integrated rural development skills in east-central and north-central regions. UNICEF also supplies equipment, teaching materials, and logistical support to these projects. A small amount of fertilizer is provided for use in agricultural demonstration project rural training centers as well.

The integrated rural development projects at Koupela in the east-central region, at Kaya in the north-central region, and the Volta Valley projects were provided with UNICEF assistance in water supply, basic health service, and village technical

Table VIII-4. Projected UNICEF Program of Cooperation, 1981-84 (Commitments and Notings)[a] ($US 000)

| | Total | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|
| Breakdown by Field of AID | | | | | |
| Child Health | 3,296 | 726 | 868 | 1,002 | 700 |
| Water Supply | 5,009 | 1,514 | 1,568 | 1,227 | 700 |
| Child Nutrition | 62 | 10 | - | - | 52 |
| Social Welfare Services for Children | 429 | - | 110 | 119 | 200 |
| Formal Education | 951 | 242 | 235 | 274 | 200 |
| Non-Formal Education | 1,123 | 351 | 277 | 295 | 200 |
| Other | 40 | 5 | 5 | 10 | 20 |

a Obligated and authorized.

Source: United Nations Economic and Social Council E/ICEF/P/L.2076 (REC). United Nations Children's Fund, Country Programme Profile, Upper Volta May 11, 1981.

activities. Between 1981-83, 3000 people in clusters of 25 to 50 families will be resettled in the Volta Valley. UNICEF support will include projects for rural water supply and construction of roads, schools, and health centers.

The 1981-83 program continues these activities. New efforts include providing agricultural supplies for a women's project in Mane (north-central Upper Volta) and Kouliere (central region). A new pilot project in Gaoua (southwestern region) will also be launched during this period. Further study of UNICEF-sponsored training and assistance in promoting nutritional surveilance may reveal opportunities to suport these activities with other health sector preparedness initiatives.

## The World Bank

The World Bank is financing four ongoing IDA-assisted agricultural projects in Upper Volta. They include the Bougouriba Agricultural Development Project ($9.5 million); the West Volta Agricultural Development Project ($9.5 million); and the Livestock Development Project ($6 million), all located in southwest Upper Volta; and the Second Rural Development Fund Project ($9.4 million), largely concentrated on the central plateau in the north. The Forestry Project ($14.5 million) was approved in February 1980, and the Niena Dionkele Rice Development Project ($6.5 million) was approved in April 1980. Table VIII-5 presents a summary of proposed financing for each of these projects.

The Forestry Project is a five-year, $600,000 effort jointly funded by the World Bank and FAO/UNDP. Its main purpose is to strengthen the Forestry Administration by giving it the means to control and manage existing forestry reserves. The project has three principal components. The first consists of technical assistance, construction and equipment for offices, logistical support, and operating expenditures. The second involves establishing rainfed plantations and rural woodlots. Studies and training comprise the third component.

While the project's institution-building component will be carried out at the Forestry Administration's headquarters in Ouagadougou, its main forestry operations--a rainfed plantation and managing a natural forest section--will be carried out in the 50,000 ha Maro forest reserve northeast of Bobo Dioulosso.

The Second Bougouriba Agricultural Development Project in the Bourgouriba ORD in southwestern Upper Volta is a five-year follow up to its first phase. Bougouriba I provided for cotton and food crop development; animal health; well construction; feeder road improvements; agricultural credit; staff training, and applied research. Bougouriba II provides for improving the agricultural extension service (training, seed production support, field

Table VIII-5. Current World Bank Projects In Upper Volta[a]

| Project Name | Credit Number | Effective Date | Closing Date | Original Principal ($US Millions) |
|---|---|---|---|---|
| Livestock Development | 557-0 | November 1975 | December 1981 | 9.00 |
| Rural Roads | 579-0 | February 1976 | December 1981 | 7.50 |
| Second Rural Dev. Fund | 640-0 | January 1977 | June 1982 | 9.40 |
| West Volta Agricultural Development | 706-0 | December 1977 | June 1982 | 3.60 |
| Regional Railway | 744-0 | December 1978 | December 1982 | 5.20 |
| Artisan Small- and Medium-Scale | 759-0 | July 1978 | December 1981 | 4.00 |
| Urban Development | 766-0 | February 1979 | December 1981 | 8.20 |
| Second Education | 956-0 | July 1979 | June 1984 | 14.00 |
| Forestry | 982-0 | December 1980 | June 1985 | 14.50 |
| Niena Dionkele Rice Development | 1013-0 | December 1980 | December 1984 | 6.50 |
| Bougouriba Agricultural Development II | 1097-0 | b | n.a. | 14.1 |
| TOTAL ONGOING PROJECT COSTS | | | | $102.0 |

[a] Projects whose credit closing date is after November 1981.

[b] Agreement date March 1981. No effective date established as of June 1981.

n.a. Not available.

Source: International Development Association, Statement of Development Credits, August 31, 1981.

trials, animal traction), supply and credit services, ORD headquarters technical assistance and construction support, establishing a monitoring unit, and pilot agricultural production schemes.

One aspect of the project's training component is designed to provide senior project staff with a series of in-house seminars at six-month intervals at PAID's Ouagadougou center. These seminars would aim at project-specific applications of management practices. This might be another opportunity to introduce emergency management concepts related to the Bougouriba ORD within project activity.

Table VIII-6 provides a list of proposed World Bank projects. While there is little information available on the proposed activities, some appear to offer potential for preparedness action.

## Conclusions

The following recommendations for potential Voltaic preparedness activities were found after reviewing AID-, World Bank-, UNICEF-, and UNDRO-financed projects.

- Develop and test a drought emergency simulation teaching tool to be used in the classroom and as a field training exercise within the context of AID-financed Agricultural Human Resource Development training components.

- Investigate the possibility of conducting joint training activities with Kansas State University's grain marketing and storage course.

- Investigate the possibility of introducing an emergency management course as a separate activity or part of the PAID-taught project management and rural development and long-term regional planning courses.

- Investigate the possibility of holding a joint seminar with the University of Pittsburgh within the context of its project management course.

- Initiate discussions with the USAID mission regarding OFDA's January 1982 participation in the rural health planning and management project design so as to introduce short-term technical assistance to conduct hazard/vulnerability analysis, resource analysis, and contingency planning within the newly created Planning Office.

- Initiate discussions with the USAID mission on possible OFDA participation in future PID missions, and arrange an information exchange.

Table VIII-6. Proposed World Bank Projects In Upper Volta

| Project Name | Government Agency Involved | Description | ($US Millions) Total IDA Committment | Status as of June 1981 |
|---|---|---|---|---|
| Koudougou ORD | Ministry of Rural Dev. | Strengthening ORD extension, training; input delivery and credit; attempt towards low-cost farming and experimental program to improve production techniques and farmers systems; reforestation; animal health program. | $20.0 | Project design under review. |
| Railways II | Railway Abidjan-Niger (RAN) | IDA funds would finance Upper Volta's share of RAN railway project with specific items to be identified. | $8.1 | Appraisal processing depends on co-donors with CIDA June 15-18. |
| Highways IV | Ministry of Public Works | Four-year phase (FY85-85) of main operations; feeder roads construction, and improvements. | $46.0[a] | Board presentation on June 15. |
| Rural Development Fund III | Ministry of Rural Dev. | Investments in small rural projects such as bottomland development, small irrigation projects, erosion controls, open and tube wells, medium-term credit for oxen, agricultural equipment, and unidentified projects. | $15.0 | Appraisal report being prepared. |
| West Volta II | Ministry of Rural Dev. | Continuation of rural development in the ORDs of Bobo Dioulasso and Dedougou including continued development of extension services, expansion of cotton and food crops, and small scale irrigation schemes. | $15.0[b] | Pre-appraisal mission in the field. |
| Kompienga Multi-purpose Project | Ministry of Rural Dev. VOLTELEC | Hydro-power, fishing, irrigation. | $20.0[c] | Appraisal scheduled for early 1982. |
| Telecom III | Ministry of Postal and Telecommunications | Expanding and upgrading telephone and and telex facilities and increased penetration into rural areas. | $16.0[c] | Appraisal report being prepared. |
| Technical Assistance | Ministry of Economy and Planning | Establishing Development Investment Budget to strengthen investment budgeting and monitoring development expenditures. | $20.0 | Project preparation underway. Appraisal scheduled for July. |
| TOTAL PROJECTED IDA COMMITTMENTS | | | $160.0 | |

[a] Co-financing agreed with the Netherlands.
[b] Co-financing agreed with the Netherlands and BOAD.
[c] Co-financing will be required.

Source: World Bank, Monthly Operational Summary (June), Johns Hopkins University Press.

- Further investigate the severity of torrential rain damage to resource reservoirs and estimate the danger of water supply contamination before determining whether any further disaster preparedness action should be taken.

# NOTES TO CHAPTER EIGHT

## UPPER VOLTA

1 OFDA, Disaster History Summary Sheet, 1981, printout.

2 AID, Rural Health Planning Project Identification Document, 1981, p. 9.

3 AID, Grain Marketing Development Project Paper, 1979 p. 91.

4 AID, Annual Budget Submission FY83, June 19, 1981.

5 Ibid.

# CHAPTER NINE

# REGIONAL APPROACH TO SAHELIAN DEVELOPMENT ASSISTANCE

AID approaches its Sahelian assistance on a regional basis by participating in the work of CILSS and the Club du Sahel. CILSS and the Club bring Sahelian countries and donors together to develop region-wide strategies and sector plans, and review development problems common to the region.

This coordination produces two results which reinforce a regional approach to Sahelian development. First, the donors who participate in the CILSS/Club program tend to adopt similar or at least complementary assistance strategies and sector priorities for the Sahel. This facilitates donor coordination in planning individual projects at the national level. Second, the Sahelian states and donors increasingly examine the Sahel's development problems and needs on a transnational basis. Many problems in one country are common to most of the region, and the efforts taken to handle them often require a regional investment for economic defficiency. This chapter discusses this regional approach and the corresponding regional projects that AID and other donors currently fund.

## AID'S REGIONAL APPROACH

AID's regional project portfolio in the Sahel grew rapidly in the early years because it provided the means for AID's participation in the CILSS/Club planning process. Many efforts originally conceived as regional projects have become regular bilateral country activities. Activities which remain in a regional category are those involving assistance to regional organizations such as the Club, CILSS, AGRHYMET, the Sahel Institute, and the river basin commissions.

### River Basin Development

The development of the Sahel's international rivers is managed by organizations representing the user nations, such as the Lake Chad Basin Commission, Senegal River Basin Development Commission, Gambia River Basin Commission, and Niger River Commission. AID is helping these international commissions cooperate with other donors to design optimum strategies to develop the Sahelian river basins.

Niger River Basin Development

The Government of Niger's efforts to achieve food self-sufficiency cannot succeed without intensively developing irrigated agriculture. Nigerien rainfall levels are too low and erratic for total dependence on rainfed agricultural production. The Niger River Basin Development Project directly contributes to Niger's food self-sufficiency through intensive development of irrigated agriculture. The Niger Basin Authority (NBA) manages this multidonor program. AID's NBA support includes providing U.S. Army Corps of Engineer technical services to design a program in river systems analysis. The analysis will pay particular attention to food production needs and implications for developing irrigated agricultural schemes. AID will also undertake bilateral efforts in the water resources field including a village hydrology project as well as financing small- to medium-scale, high impact irrigation activities.

In conjunction with NBA and other donors, AID will also pursue other areas of assistance to the Kandadji dam project. The construction of this dam is the largest infrastructure project to be undertaken in Niger during the next five years. The dam will be located on the Niger River approximately 190 km upstream from Niamey. It will increase irrigated agriculture and provide much of western Niger's electrical power requirements. The dam is expected to cost $1 billion. The estimated cost for relocating infrastructure and the approximately 21,000 persons the dam will displace is $44 million. The government estimates that 129,000 ha of land will be made available for irrigated farming development by the dam.

AID's coordination role with the NBA ensures both that member states, donors, and planners will address regional concerns while Niger's water resource development efforts will not be independent of other countries the river travels through (Cameroon, Ivory Coast, Benin, Guinea, Mali, Nigeria, Upper Volta and Chad). Particular emphasis will be given to ensuring coordination between NBA and Niger's High Commission for the Construction of the Kandadji Dam. Table IX-1 has a breakdown of AID assistance to this regional project.

Gambia River Basin Development

The OMVG (Organisation pour la Mise en Valeur du Fleuve Gambia) was formed in 1978 by Gambia and Senegal to promote and coordinate the Gambia River basin development. Guinea later applied for membership.

In order to harness the Gambia River, the OMVG is proceeding to study and eventually contruct an anti-salinity barrage in the Gambia (Yelitenda) and a dam in Senegal (Kekreti). In addition to providing large-scale irrigation potential, the dams will also provide hydroelectric power.

Table IX-1. Ongoing and Proposed Regional Sahel Program Financed by AID

| Project Name and Number 625-- | Responsible Mission | FY of Initial Obligation | Project Comp Year | Project Costs FY 82 Obl ($US 000) | Project Costs FY83 AAPL ($US 000) | Total LOP Auth |
|---|---|---|---|---|---|---|
| Gambia River Basin Dev. 0012 | Gambia | 81 | 85 | 4,000 | 1,769 | 13,300 |
| Support for Private Sector A.I.P. 0252 | Senegal | 82 | 82 | 500 | -- | 500 |
| Sahel Regional Aid Coordination and Planning (Sahel Institute) | Mali | 81 | unk. | unk. | 545 | unk. |
| AID Cooperation and Planning (CILSS Secretariat) 0911 | Upper Volta | 78 | 83 | 650 | 816 | 2,565 |
| Regional Population and Family Planning A.I.P. 0910 | Mali | 82 | 86 | 200 | 400 | 2,500 |
| Niger River Development Planning 0915 | Niger | 77 | 84 | 3,500 | 2,289 | 9,000 |
| Demographic Data Collection and Analysis 0927 | Mali | 80 | 85 | 1,400 | 1,500 | unk. |
| Regional Food Crop Protection 0928 | Mali | 79 | 83 | unk. | unk. | unk. |
| | Senegal | 79 | 84 | — | -- | 8,300 |
| (Integrated Pest Mgt.) | Upper Volta | 78 | 85 | 3,400 | 1,650 | 25,280 |
| Planning, Mgt. & Research 0929 | Cape Verde | 79 | cont. | 110 | 60 | cont. |
| | Gambia | 81 | cont. | 75 | 75 | cont. |
| | Mali | 80 | cont. | 1,400 | 1,500 | cont. |
| | Mauritania | 78 | cont. | 225 | 225 | cont. |
| | Niger | 80 | cont. | 584 | 250 | cont. |

Table IX-1. (Continued)

| Project Name and Number 625-- | Responsible Mission | FY of Initial Funding | Project Comp Year | Project Costs FY 82 Obl ($US 000) | Project Costs FY83 AAPL ($US 000) | Total LOP Auth |
|---|---|---|---|---|---|---|
| (includes OMVS requirements) | Senegal | annual | cont. | 1,200 | 1,000 | cont. |
| | Upper Volta | cont. | cont. | 405 | 325 | cont. |
| IVO Sahel Wells 0934 | Mali | cont. | cont. | 496 | 500 | n.a. |
| Sahel Manpower Development 0936 | Cape Verde | 80 | 84 | 500 | 500 | cont. |
| | Gambia | 81 | cont. | 350 | 400 | n.a. |
| | Mali | 79 | 84 | 350 | 350 | n.a. |
| | Mauritania | 79 | 84 | 800 | 1,000 | n.a. |
| | Niger | 79 | 83 | 500 | 510 | n.a. |
| | Senegal | annual | cont. | 650 | 700 | n.a. |
| | Upper Volta | cont. | cont. | 375 | 75 | n.a. |
| Accelerated Impact Program 0937 | | | | | | |
| Tambacara Wells M'Pessoba | Mali | cont. | cont. | 140 | 500 | n.a. |
| Unspecified A.I.P. | Gambia | cont. | cont. | 100 | 100 | n.a. |
| Land Tenure | Mauritania | 82 | 82 | 500 | — | 500 |
| Family Health | | 82 | 82 | 450 | -- | 450 |
| Sahel Water Data & Mgt. Phase II 0940 | Niger | 81 | 85 | 800 | 1,500 | 6,500 |
| Special Self-Help 9901 | Cape Verde | 79 | cont. | 25 | 25 | n.a. |
| | Gambia | cont. | cont. | 100 | 100 | n.a. |
| | Niger | cont. | cont. | 60 | 70 | n.a. |
| | Senegal | annual | cont. | 125 | 125 | n.a. |
| | Upper Volta | cont. | cont. | 200 | 225 | n.a. |
| Accelerated Impact Program 0937 (unspecified) | Senegal | annual | cont. | 500 | -- | n.a. |

Sources: Annual Budget Submissions FY83, June 1981 for Cape Verde, Gambia, Mali, Mauritania, Senegal Niger, and Upper Volta.

Within this program, the basin's development priorities include grain self-sufficiency, (rainfed and irrigated agriculture), meat production (livestock and poultry), and forestry growth. Total investment funding is an estimated $511 million. About $60 million of this will be spent for pre-investment plans and studies, $350 million for infrastructure, and $101 million for production research and implementation.

Current AID investment in the Gambia River Basin Development Project is $13.4 million. This investment, together with a $8.3 million UNDP commitment, will finance a pre-investment study of the production project's critical planning and implementation areas. Current estimates place the amount of potentially irrigable land at 77,000 ha. Both the Gambia and Senegal plan to continue expanding agricultural projects as the OMVG program unfolds.

The AID project goal is to create a planning division within the OMVG and thereby establish it as an effective coordinating agency. Major AID project outputs include:

- Complete river basin aerial photography, mapping , and ground surveys to provide land utilization and inventory data;

- An environmental and socioeconomic study to collect data for planning purposes; predict positive and negative dam construction impacts; recommend mitigative action to offset or maximize those impacts; and provide data on the economic feasibility of proposed activities for donor investment; and

- Providing long-term American technical assistance and on-the-job and academic training to increase the OMVG's capacity to carry out its full responsibilities.

Academic, technical and on-the-job training may also provide an opportunity to introduce preparedness planning as an element of the OMVG planning function. Discussions could be held with the AID mission to determine how preparedness might be introduced at this preliminary stage.

## Senegal River Basin Development

The OMVS (Organisation de Mise en Valeur du Fleuve Senegal) was formed in 1971 by Mali, Mauritania, and Senegal. Under OMVS auspices, various studies and projects are now underway to realize this river basin's potential as an integrated river system. The principal components will be two dams operating in concert. The first OMVS development phase involves constructing a dam at the village of Diama and retention dikes on both sides of the river from Diama to Rosso.

increase the availability of trained Sahelians in priority development areas who will contribute to economic and social development, particularly in programs benefitting the poor majority.

Each participating Sahelian government cooperates with the AID mission to develop and submit a training proposal. Training priorities and recommendations are established by incountry training committees. Participant selection is made with joint AID and host country involvement. Since 1976, 160 Sahelians have been trained in the United States and Africa.

Students are trained in education administration; agricultural crop and livestock research including agronomy, plant pathology, irrigation, soils science, seed technology, range management, agricultural economics and farm management; agricultural engineering; public health and para-medical skills; veterinary medicine and animal husbandry; cooperatives; forestry development and economy; environment and energy; nutrition; family planning; maternal child health; public administration; project management; and non-formal education.

This project provides an opportunity to intitiate a preparedness training effort with Sahelian students studying in the United States. In addition, each mission keeps a roster of returning students and briefly analyzes how appropriately they have used their training-gained expertise. These students might also be a potential audience for an incountry preparedness planning seminar.

AGRHYMET

The Sahel Water Data Network and Management Project (Phases I and II) is the veheicle for U.S. assistance to the CILSS Agrometeorological/Hydrological (AGRHYMET) Program for the Sahel. The AGRHYMET Program goal will help Sahelian farmers, herders, and national planners make better short- and long-term decisions on agricultural and livestock production planning and operations. These decisions will be based on more timely, complete, and accurate weather and climatic data and better knowledge of cyclical events and their impact on water, soils, vegetation, and crops. AGRHYMET's purpose is to develop a regional system to produce this data and make it available to farmers, herders, planners, and other users. The system includes agrometeorological and hydrological services in each CILSS country, and a regional coordinating and training facility located in Niamey. Information and knowledge which AGRHYMET will ultimately produce will improve CILSS country agricultural production, land use, and environmental conservation decisions for the Sahel.

Phase I of AGRHYMET began in 1975 with U.S. assistance commencing in 1976. U.S. assistance amounted to $6,268,000, 28 percent of the total $22,708,000 donor contributions. UNDP was the largest contributor, providing $11,725,000 for technical assistance, training, and equipment and operational support. The Netherlands contributed $3,283,000 for similar inputs. Belgium provided data bank equipment and related technical assistance worth $912,000. Other donor assistance came from Switzerland ($265,000), France ($155,000), and the Federal Republic of Germany ($100,000).

Phase II is a transitional phase during which all basic operational system elements will be completed and consolidated into networks and some user-directed operations will commence. When the system is in full operation after Phase II, it will include the operation of fully equipped field observation stations, continuous data recording and regular reporting through modern transmission and receiving systems; data verification and analysis at national centers and the Niamey regional center; information dissemination to primary producers and planners; and continuous producer application of the information in their agricultural planning decisions and activities. The full operational phase will also include regular instruments and equipment maintenance, documentation and publication services, and a continuing training element for technician replacements and maintaining and upgrading expertise.

AID is providing professional training in the United States in agro-meteorology and operational hydrology to support this project, as well as technical assistance, equipment, and commodities. This project might provide several opportunities to integrate the network being instituted with the requirements for weather/crop yield forecasting. Follow up discussions with WMO, as the leading executing agency and coordinator of all donor assistance, are needed to determine the nature of the linkages which could be made in this regard. In addition, students receiving training in conjunction with this project might also be candidates for further training in how to use and interpret crop yield models.

## Population

Demographic data collection and analysis will be undertaken to provide the necessary information to facilitate consideration of Sahelian population planning measures.

## Management of the AID Regional Sahel Projects

AID's regional project management is influenced by the project's character and the specific arrangements developed by the Sahelians. In the case of the river basins, for example, the

commissions are generally responsible for mainstream infrastructure development, with member states responsible for specific incountry development or the broader economic planning and actions related to actual basin development. Responsibility for managing AID river basin commission assistance is assigned to a particular AID country mission where it is more appropriately handled. Senegal River basin development is managed by USAID/Dakar, Niger River basin development by USAID/Niamey, and the Gambia River basin development by USAID/Banjul.

## National and Regional Security Grain Stocks in the Sahel

An emerging regional Sahelian issue is to establish a regional plan for emergency security grain stocks. In response to a 1979 CILSS request, FAO undertook a pre-feasibility study of problems involved in establishing food security stocks at both national and regional levels. A project document was signed in March 1980 between FAO and CILSS for conducting a feasibility study to examine in greater depth the options recommended, and prepare a project suitable for presentation to various financing sources.

The option CILSS selected involves a mixed system in which national stocks belong to and are managed by individual countries while regional stocks are placed under the supervision of CILSS and concerned donors. Any food stock usage would be subject to their agreement in advance with a view to eventual replacements.

A meeting was scheduled in September 1981 to discuss adopting a national and regional security grain stock strategy in the Sahel, but was postponed until January 1982. ODFA might want to attend this meeting to ensure that adequate preparedness planning measures are incorporated into the implementation plan adopted. Meanwhile, OFDA could lobby within AID/W and with the Sahelian missions for support of preparedness management considerations in this emergency security grain stocks plan.

## Food and Agriculture Organization

This analysis did not include a visit to FAO headquarters in Rome to gather project-specific information regarding this organization's Sahelian activities. Information gathered on FAO and presented in the previous chapters was collected at UNDP. Tables are included that reflect UNDP-financed projects in each country and indicate where FAO is the executing agency. For the purposes of a regional project inventory, the following table illustrates the type and magnitude of FAO Sahelian investment. Sahelian countries are designated by the letters CVI, GAM, MLI, MAU, NER, SEN, AND UPV.

Analyzing this information reveals that FAO is involved in animal production and health, agricultural develoment, research and training, fisheries development and training, forest and water resource development, and developing of oncho-freed areas. Also of major importance are FAO's desert locust, crop protection, and food loss programs.

United Nations Development Program

UNDP has ongoing regional programs throughout the Sahel in river basin development, road construction, and technical assistance connected with United Nations Capital Development Fund projects. Next to river basin development, which constitutes most of UNDP's regional investment, institutional support for the CILSS Club, United Nations Sahelian Office, the Sahel Institute, and the Liptako-Gourma Authority comprises a substantial category of investment. Table IX-2 illustrates the nature and amount of that assistance. For details on national projects see chapters two through eight.

Table IX-2. UNDP-Approved and Ongoing Regional Projects in the Sahel

| Project Name and Number RAF/-- | Description | CILSS Countries Involved | Host Country | Expenditures 1977-81 ($US 000) |
|---|---|---|---|---|
| Institutional Support to UNSO to Expand its Operational Capability 77/037 | This project covers UNDP's share of institutional support costs necessary to implement the joint UNSO/UNDP venture to increase UNSO operational capability for undertaking its additional responsibilities to assist on UNDP's behalf the 15 countries concerned with implementing the Plan of Action to combat desertification in the Sudano-Sahelian region. | All[a] | Upper Volta | 450,000 |
| Institutional Support to the Lake Chad Basin Commission 71/252 | The Lake Chad Basin Commission has been formed by the four riparian states to plan and monitor the Basin's integrated development. This project is providing institutional support to the Commission such as, subcontracted expert services, administrative support, and training. | Niger[b] | Chad | 823,446 |
| Institutional Support to the CILSS 74/046 | The project aims to strengthen the CILSS Technical Secretariat to help its member states establish effective technical cooperation among themselves and thereby facilitate their recovery from the disastrous current drought effects and further their individual and regional long-term development. | All | Upper Volta | 852,265 |
| Development of the River Niger Commission 75-038 | The goal is to help the River Niger Commission plan an integrated development scheme for the basin's land and water resources to achieve optimum economic and social benefits. | MLI, NER,[b] UPV | Niger | 83,417 |
| Assistance to Club du Sahel 77/301 | The project will help the Club du Sahel Working Groups carry out their activities for developing long-term strategies for Sahelian development. | All | | 218,861 |
| Institutional Support for the Sahel Institute 78/012 | The objective is to provide institutional support to help the Institute contribute to solving basic global and integrated Sahelian development problems. | All | Mali | 879,669[b] |

Table IX-2. (Continued)

| Project Name and Number RAF/-- | Description | CILSS Countries Involved | Host Country | Expenditures 1977-81 ($US 000) |
|---|---|---|---|---|
| Institutional Support to the Liptako-Gourma Authority, Phase II 78/026 | The project will help the Liptako-Gourma Authority promote the joint development of common resources in agriculture, livestock, water management, small-scale industries, forestry, fertilizers, energy, and so on. | UPV, MLI, NER | Upper Volta | 569,793 |
| Assistance to the Conference Between African States and Multinational Enterprises for the Promotion of Foreign Trade 78/058 | The conference's goal is to ensure co-operation between participating African countries and multinational enterprises in order to establish a new economic order and to ensure a more equitable partnership between the transnational corporations and developing countries. | UPV, MLI, MAU, NER, SEN | | 81,818[b] |
| Assist OMVS in Evaluating Diama and Manantali Dam Construction Bids 79/021 | The objective is to help the OMVS evaluate international bids for constructing the dams at D'ama and Mantanali. | MLI, MAU, SEN | Senegal | 160,570 |
| Technical Assistance Connected with UN Capital Development Fund Projects 79/023 | The project's immediate objectives of the are to: increase recipient governments' awareness of objectives, means, and working methods; help identify capital project suitable for UNCDF financing; help analyze and solve problems facing ongoing UNCDF activities; and prepare feasibility studies of newly identified capital project proposals. | All[b] | UNCDF | 200,000 |
| Trans-Saharan Highway (Zinder-Agadez Road) Preparatory Assistance 79/058 | Prepare terms of reference for all necessary technical studies. | MLI, NER | | 15,457 |

a Includes Chad.

b Includes other countries besides the Sahel.

Source: UNDP Status Report, Regional Programme for Africa, 1977-1981, March 1981.

Note: Does not include projects completed in 1981.

# CHAPTER TEN

# VOLUNTARY AGENCIES IN THE SAHEL

Private voluntary agencies (PVOs) play a relatively small though important role in Sahelian development. Their contributions to drought relief and rehabilitation programs during the 1970s drought have been estimated at $25 million [1].

Except for Catholic Relief Services (CRS) which is also involved in Title II food distribution, most voluntary agency programs focus on specific village-level activities. The voluntary agencies' emergency relief role is significant due to their flexibility, quick response capability, and grass roots working relationships. PVOs could also serve an important emergency preparedness role through their development efforts. This chapter will focus upon PVO projects in Cape Verde, the Gambia, Senegal, Mali, Mauritania, Niger, and Upper Volta, and identify potential preparedness opportunities.

There are more than 60 PVOs supporting a variety of Sahelian activities. This support manifests itself in primarily three ways:

- By having incountry PVO offices, representatives or both that monitor and manage PVO-supported projects with help from local volunteers;
- By acting as a channel for funds through a coordinating body such as Church World Service and the World Council of Churches; and
- By providing assistance and material support to an indigenous PVO or community organization.

Table X-1 summarizes PVO activities. Annex C lists these organizations and activities by country. A fuller description of some more interesting project activities by country follows. The role of CRS and Title II food distribution will not be discussed here. Details on those programs can be found in preceeding chapters.

## Cape Verde

Cape Verde has only five to six PVO programs with total assistance averaging less than $10,000 annually per program. The largest of these programs was a CRS-supported activity on Sao Tiago Island in 1978. This project involved nutrition education and rural women's literacy training. CRS has no physical presence

Table X-1. American Private Voluntary Agencies Working in the Sahel

(1981)

| Agency | Countries of Involvement | Area of Activity |
|---|---|---|
| AFL-CIO | Mali, Niger, Senegal | Industrial development and management, construction and housing, education scholarships and fellowships. |
| African-American Institute | Cape Verde, Gambia, Mali, Mauritania, Niger, Senegal, Upper Volta | |
| Africare | Gambia, Mali, Niger, Senegal, Upper Volta | Community development, food production and agriculture, construction, housing and planning, medicine and public health, education. |
| American Committee for Cape Verde | Cape Verde | Cooperatives, credit unions and loans, education equipment and material aid, food production and agriculture. |
| American Friends Service Committee | Mali | Community development, cooperatives, credit unions and loans. |
| American National Red Cross | Upper Volta | Equipment and material aid. |
| American ORT Federation | Mali | Economic and development planning. |
| Assemblies of God | Senegal | Education. |
| Baptist World Relief | Senegal, Upper Volta | Food production and agriculture. |
| CARE | Mali, Niger | Food production and agriculture. |
| Catholic Medical Mission Board | Gambia, Senegal, Upper Volta | Medicine and public health. |
| Catholic Relief Services | Cape Verde, Gambia, Senegal, Mauritania, Upper Volta, Niger | Community development, food production and agriculture, medicine and public health. |
| Christian and Missionary Alliance | Mali, Upper Volta | Food production and agriculture, medicine and public health. |
| Christian Reformed World Relief Committee | Niger | Food production and agriculture. |
| Church World Service | Cape Verde, Niger | Community development, equipment and material aid, food production and agriculture. |

| Agency | Countries of Involvement | Area of Activity |
|---|---|---|
| Credit Union National Association | Senegal | Cooperatives, credit unions and loans. |
| Damien-Dutton Society for Leprosy Aid | Gambia, Niger | Medicine and public health, equipment and material aid. |
| Darien Book Aid Plan | Niger | Equipment and material aid. |
| Direct Relief Foundation | Mauritania | Medicine and public health. |
| Education Development Center | Mali | Medicine and public health. |
| Family Planning International Assistance/Planned Parenthood | Gambia, Mali | Population and family services. |
| Ford Foundation | Mali | Education. |
| Foster Parents Plan | Mali, Upper Volta | Community development, education, medicine and public health. |
| Goodwill Industries of America | Mauritania | Industrial development and management. |
| Gospel Missionary Union | Mali | Education. |
| Helen Keller International | Senegal | Education. |
| International Church Relief Fund | Mali | Community development. |
| International Executive Service Corps | Gambia | Industrial development and management. |
| International Voluntary Services Corps | Mauritania | Medicine and public health. |
| Lions Clubs in the U.S. | Mali, Niger | Social Welfare. |
| Lutheran World Ministries | Mauritania | Equipment and material aid, medicine and public health. |
| Lutheran World Relief | Niger, Mauritania | Community development, construction, housing and planning, cooperatives, credit unions and loans, medicine and public health, food production and agriculture. |
| MAP International | Mali, Niger, Upper Volta | Equipment and material aid. |
| Marist Missionary Sisters | Mauritania | Medicine and public health. |
| Society of Mary | Niger | Equipment and material aid. |

| Agency | Countries of Involvement | Area of Activity |
|---|---|---|
| Mennonite Central Committee | Upper Volta | Food production and agriculture. |
| National Council of Catholic Women | Senegal | Medicine and public health. |
| Near East Foundation | Gambia | Cooperatives, credit unions and loans, food production and agriculture. |
| New Tribes Mission | Senegal | Communications, medicine and public health. |
| Operation Crossroads | Cape Verde, Gambia, Mali, Mauritania, Niger, Upper Volta | Construction housing and planning, medicine and public health, education. |
| Opportunities Industrialization Centers International | Gambia | Education, food production, and agriculture. |
| Oxfam-America | Niger, Upper Volta | Cooperatives, credit unions and loans, food production and agriculture. |
| Partnership for Productivity | Upper Volta | Economic and development planning. |
| Pathfinder Fund | Gambia, Mali, Senegal | Population and family services, equipment and material aid. |
| Salesians of St. John Bosco | Cape Verde | Education, social welfare. |
| Save the Children Federation/ Community Development Foundation | Upper Volta | Food production and agriculture. |
| Seventh Day Adventist World Service | Upper Volta | Food production and agriculture. |
| Southern Baptist Convention | Niger, Upper Volta | Education, social welfare, food production and agriculture. |
| Sudan Interior Mission | Niger, Upper Volta | Education, medicine and public health, equipment and material aid, food production and agriculture, social welfare. |
| Summer Institute of Linguistics | Mali, Upper Volta | Education. |
| United Church Board for World Ministries, United Church of Christ, Divisions of World Mission and World Service | Senegal, Niger | Food production and agriculture. |

| Agency | Countries of Involvement | Area of Activity |
|---|---|---|
| United Methodist Committee on Relief | Niger, Senegal | Equipment and material aid, food production and agriculture. |
| United World Mission | Mali, Senegal | Education, social welfare, food production and agriculture, medicine and public health. |
| VITA | Upper Volta | Education. |
| White Fathers of Africa | Upper Volta | Food production and agriculture, medicine and public health. |
| World Neighbors | Upper Volta | Food production and agriculture. |
| World Rehabilitation Fund | Niger, Mali | Equipment and material aid, medicine and public health. |
| World Relief Commission of the N.A.E. | Upper Volta | Equipment and material aid. |
| World Relief Corporation | Mali | Equipment and material aid, food production, and agriculture. |
| World Vision Relief Organization | Gambia, Mali, Upper Volta | Food production and agriculture, education, medicine and public health. |
| Worldwide Evangelization Crusade | Gambia | Education, food production and agriculture, medicine and public health. |
| YMCA | Gambia, Senegal | Community development, social welfare. |

Source: TAICH Country Reports.

in Cape Verde. Title II food distribution constitutes its major activity, but the program is monitored from CRS's Senegal office.

The Gambia

There are 15 American PVOs supporting activities in the Gambia. Most programs are small, averaging under $20,000 each annually, CRS has the most significant program totalling $77,000 in 1981. CRS supports activities in oil seed promotion and integrated literacy development. CRS has three American representatives in the Gambia.

Mali

There are 22 American PVOs which support Malian activities. However, only half have a permanent physical presence there. Of those organizations with a Malian office, Africare, American Friends Service Committee, American ORT Federation, CARE, and Foster Parents Plan have the largest programs.

Africare's 1981 Malian budget was over $260,000. Three American Africare representatives provide oversight and liaison for construction and housing projects (dispensaries, wells, maternity clinics, a fish breeding pilot station, houses, and roads) as well as medical equipment and supplies for a maternity clinic.

The most significant Malian Africare efforts are food production and agriculture projects that include an AID-supported, Peace Corps-assisted fisheries project in the fourth and fifth regions. This project promotes fish production by operating a pilot station to breed, hatch, and distribute fish. Africare also constructs wells and animal feeding implements and encourages commercial vegetable farming through a Malian vegetable project.

American ORT also has a substantial Malian program with a 1978-81 $1 million host country contract from USAID/Bamako. American ORT activities focus on an economic and development planning project to create an indigenous rural development capability by involving villagers in all stages of identifying, planning, financing, and implementing various public works activities. This project also involves training 16 rural community development agents through a combination of seminars and on-site demonstrations. The project could be used as a model for introducing additional preparedness program management skills. There is no information about ORT's future Malian project plans.

CARE has a $1.1 million Malian program focusing primarily on well construction. They have two AID operational program grants which have financed some $400,000 in well construction, training,

maintenance and repair, and health education efforts. CARE recently signed a three-year $520,000 agreement with the Dutch for an expanded wells construction program to begin in FY82. Under the auspices of a matching grant from AID, CARE proposes to begin a forestry project, probably modeled after its Nigerien program, next fiscal year.

Mauritania

There are nine American PVOs supporting activities in Mauritania. Only six have a physical presence in the country. Of these, the CRS program is the largest. CRS operates two Mauritanian projects this year. The first is an AID-funded $541,543 outreach program to provide logistical support for food distribution activities. The second is a nutritional program conducted through maternal child health centers and maternity clinics. It is funded by a $150,000 IBM grant. CRS continues its food distribution program in Mauritania with Title II foods.

Niger

There are nearly 20 American PVOs supporting Nigerien development projects. Most of the annual programs are valued at considerably less than $50,000. The substantially larger programs include Africare, CARE, CRS, Church World Service (CWS), Lutheran World Relief (LWR), and the Sudan Interior Mission (SIM). Almost half of the 20 organizations have resident representatives in Niger.

Africare operates farmers' training and orientation programs for cash crop production and supports an irrigation project with a well digging component. The Lilly Foundation is helping Africare construct a 200 ha irrigated cropping area and provide extension services to farmers on underutilized bottomlands of the Niger River flood plain. Perhaps Africare's most significant involvement, however, is in the health sector. It has designed a public health program of maternal and child health services, environmental sanitation, community health education, medical services and training. One interesting aspect of Africare's health sector involvement is that it is strengthening the Ministry of Health's Bureau of Statistics' role in designing a data collection and analysis system, with epidemiological bulletins for national and international use. This project may have real potential for health emergency preparedness planning. The Africare program was over $1.6 million in 1980.

CARE's $350,000 FY82 Niger program will be directed towards three projects, two in forestry and one in agricultural diversification. The forestry projects are located in the Tahoua

Department and include establishing windbreaks, nurseries, village woodlots, live fencing, and sand dune stabilization. The agricultural diversification project is located near Niamey and includes well construction to promote irrigated dry season vegetable cropping for consumption and marketing in Niamey.

Catholic Relief Services' primary Nigerien involvement is through an AID operational program grant for the Tapis Vert project. CRS has subcontracted with Strategies for Responsible Development (University of Dayton, founded by the Society of Mary) and the Institute for the Study and Application of Integrated Development (Toronto) to administer and operate this project. In addition to agricultural activities, this project also includes community health improvements. CRS is more directly involved in food production and agriculture through developing water resources, animal traction, chicken or rabbit production, and small appropriate technology devices for agricultural production.

Church World Service's FY82 Nigerien program has an estimated $300,000 budget. CWS's involvement is focused primarily in the Air Mountains with a garden project, in an integrated development project in Zinder, and village well digging, agricultural training, and fish production.

Lutheran World Relief has 12 to 14 projects in Niger and a $900,000 FY82 budget. Its projects include agricultural projection, pre-cooperative support, and forestry. Unlike many PVOs which work through a counterpart community organization, LWR works directly with the Government of Niger to oversee its projects.

The Sudan Interior Mission also has a Nigerien program budget nearing $1 million. SIM operates primary schools, a general and surgical hospital and dispensary, and maintains a leprosarium and maternity center. SIM has 48 U.S. and 39 international personnel in Niger.

## Senegal

There are 16 American PVOs supporting projects in Senegal. Seven have incountry representatives, but all have very small programs. One of the more recent developments in Senegal's voluntary agency community is the proposed creation of a coordinating body like those in Upper Volta and Niger (SPOND and GAP). CWS is responsible for organizing a PVO conference to discuss this subject in November 1981. These coordinating groups of PVOs working in the Sahel (American and international) are designed both as funding vehicles and to facilitate information exchange. Member agencies have strongly resisted past moves to make these coordinating bodies operate.

Over $120,000 out of CRS's AID-funded Sahel generic grant will be directed to Senegal in 1981 to support maternal and child health and agricultural/fisheries projects in the Casamance. The Wassadou Agriculture and Development Extension Project received $500,000 under this grant. It will continue until September 1982. This project includes a river bank reinforcement component and also organizes and trains cooperative managers. CRS hopes the Sahel generic grant will be renewed in 1982.

Other PVOs working in Senegal support urban education and training programs (AFL-CIO, YMCA, United World Mission, Helen Keller International, Assemblies of God, and African-American Institute); medicine and public health (CRS, New Tribes Mission, and World Vision); credit union support (Credit Union National Association); and food production and agriculture (Africare, CRS, and CWS).

Upper Volta

The largest PVO programs in Upper Volta are Africare, CRS, Foster Parents Plan, Mennonite Central Committee (MCC), Partnership for Productivity (PFP), and Save the Children. Their annual programs range from $200,000 to $300,000. MCC has two Americans in Upper Volta who help a water resource development project in the northwest. They cooperate with the Christian and Missionary Alliance. MCC trains local teams to improve hand-dug wells, construct small earthern dams, and conduct agricultural research. PFP also has two Americans working in Upper Volta in a pilot program designed to foster rural enterprise development. PFP supplies technical advisers in Diapaga and Fada n'Gourma who are designing and testing both a credit plan to help new entrepreneurs acquire operating capital for loan-worthy projects and a technical assistance package to upgrade business practices. AID partially funds this program. Other cooperating organizations include the U.S. Peace Corps, Africare, and VITA. Foster Parents Plan supports a program of reforestation, primary school and dam construction, non-formal and farmer education, scholarships, and a farmer credit program for village stores, cattle raising, oxen plows, and grain mills. The organization has one American in Ouagadougou.

Africare's major Voltaic activity is the AID-financed Senguenega Integrated Rural Development Project. This project is designed to improve the economic conditions and quality of life for the rural poor. It includes agricultural production, health, education, rural road construction, and regional government support. Outside the Seguenega project, Africare supports dam and well construction, maternity hospital construction, and forestry projects.

Other PVO Activities

There are two areas of PVO activity in the Sahel which have special promise for emergency preparedness. One concerns the practical application of nutritional surveillance systems as part of a health and food emergency management system.

AID funded CRS's development of the Growth Surveillance System. Its purpose is to promote an effective food and nutrition program by integrating food supplements, nutritional surveillance, and nutrition education. These are concepts that the CRS-supported food and nutrition program in Africa has used ever since it began more than 10 years ago. However, the system being used before 1977 followed children's weights on individual growth charts (Ilesha charts) which the mothers took home with them. As these charts were increasingly used, certain disadvantages began to appear. First, the growth curve on the chart, while meaningful to people who studied graphs in school, was meaningless to most mothers in the program. Second, since mothers brought the charts home with them, no up-to-date program monitoring could be carried out. Sample evaluations were made from time to time, but there was not enough information for planning and monitoring. Third, the chart was very difficult to print and reproduce, and it was necessary to use paper that last five years. Finally, the old system was suited for one system of measurement only, one age group only, and one time period only.

AID funded the revision of this nutritional surveillance system to provide more flexibility than the old system. The new charts were first designed for use in emergency programs where an on-going, up-to-date assessment of the situation was necessary. The new Growth Surveillance System is a group record of all children who visist a maternal child center in one day. During the testing of this system in a Kenyan emergency program, the new charts' value for not only emergency but also "normal" programs became apparent. The system was tested and found superior in Kenya, Tanzania, Ghana, and Lesotho. In addition, it has been introduced as part of the CRS food and nutrition program in the Gambia, Senegal, Sierra Leone, Upper Volta, Ethiopia, Rwanda, Burundi, the Seychelles, Djibouti, Cameroon, and Madagascar. Late in 1981 the system will also be introduced into the Sudan and Zaire[2].

In Kenya the Growth Surveillance System proved to be very effective in planning a food emergency operation in the drought-stricken area of Turkana. Not only did the charts provide information about the degree of malnutrition, but they also helped to direct and chart the relief program's progress in response to the famine. This system has the potential of being one building block for designing a national health emergency preparedness and management system.

The second PVO activity area concerns participant training. The programs of African American Institute (AAI) and Operation Crossroads Africa are especially relevant. The AID-funded and AAI-administered African Graduate Fellowship Program finances U.S. graduate education for more than 125 students each year. Upper Volta, Niger, Senegal, Mali, and Mauritania all participate in this program. In addition, AAI does a considerable amount of programming for the International Communications Agency (ICA). Both their programs offer opportunities for emergency preparedness training.

Operation Crossroads supports a cultural exchange program called the African Leaders Program. It brings African professionals nominated by their governments to the United States for a five- to six-week program designed by Crossroads. About 80 percent of these participants have held their positions for at least three years and 30 to 40 percent move to higher positions within a year of completing the African Leaders Program. About 80 percent of participants come from government ministries and each group usually consists of 15 to 20 people[3]. Table X-2 illustrates the nature and extent of Sahelian participation in this program in 1981.

ICA provides 95 percent of the financing for this program. If the proposed 1982 financing materializes, Crossroads has four groups of programs scheduled (April-May; June-July; August-September; and September-October). The most relevant of these programs include those focusing on management for outstanding public administration school graduates; local government planning and organization (both in French and English); policy direction for central economic planning for agriculture; agricultural cooperatives development; and policy direction for national health delivery systems (all in French, English, and Portuguese). These programs provide opportunities for an orientation and exchange of ideas on emergency preparedness.

## CONCLUSION

PVO activities in the Sahel showing the most potential for emergency preparedness include CRS's Growth Surveillance System, and Operation Crossroads and AAI's cultural exchange, participant training, and graduate educational programs. The remaining PVO activities show only marginal preparedness potential, although the idea of using PVO-supported project personnel as agents for preparedness planning warrants further investigation.

## [illegible] AND EXTENT OF SAHELIAN PARTICIPATION IN OPERATION CROSSROADS AFRICAN LEADERSHIP PROGRAM

(1981)

| Selected Subjects | Cape Verde | Gambia | Mali | Mauritania | Niger | Senegal | Upper Volta | Total Sahelian | Total in Program |
|---|---|---|---|---|---|---|---|---|---|
| | number of participants | | | | | | | | |
| Health Delivery Systems | 1 | - | - | - | - | 1 | - | 2 | 24 |
| Personnel Management | - | - | 1 | - | 1 | - | - | 2 | 15 |
| Rural Youth Education | - | 1 | - | 1 | - | - | - | 2 | 17 |
| Local Govt. Planning | - | 1 | 1 | - | - | - | - | 2 | 10 |
| Agricultural Integration | 1 | - | - | - | - | 1 | - | 2 | 13 |
| National Fisheries Policy | 1 | 1 | - | 1 | - | 1 | 1 | 5 | 13 |
| Public Adm. | - | - | 1 | 1 | 1 | 1 | 1 | 5 | 19 |
| Economic Planning | - | - | 1 | - | - | - | - | 1 | 8 |

Source: Operation Crossroads Africa, 1981, African Leaders Program.

## NOTES TO CHAPTER TEN

1. Brown, Barbara J., Tuthill, Janet C., and Rowe, E. Thomas, "International Disaster Response: The Sahelian Experience," U.S. Department of State, Washington, D.C. 1976.

2. Catholic Relief Services, Growth Surveillance System, Final Narrative Report, April 1981, p. 4.

3. Interview with Bart Rousseve. Operation Crossroads Africa, October 12, 1981.

# CHAPTER ELEVEN

# THE PEACE CORPS IN THE SAHEL

The Peace Corps has over 460 volunteers in programs in all countries covered by this study except for Cape Verde. The largest program in Niger has over 135 volunteers; the smallest is in Mauritania. The following discussion provides more detail on the nature and extent of Peace Corps involvement in each country.

## Gambia

There are 55 Peace Corps volunteers (PCVs) in the Gambia. Only 15 percent are based in Banjul. The largest program sector is health education. PCVs are helping the government implement village-level primary health care. They are involved in public health education, water/sanitation, nutrition, and food handling, preservation, and storage.

The second largest program is in education and cultural preservation. The rural training program has nine PCVs and has been operating only two years. It focuses primarily on handicrafts and mechanics. In food production, five PCVs are working to introduce and maintain fish farms, including marketing and improving processing techniques with appropriate technologies.

## Mali

Compared to other countries in Africa, Peace Corps involvement in Mali is relatively recent, dating from 1977. In 1980, there were 53 volunteers working in education, health, community development, energy and agriculture. Twelve volunteers work in rural health, preventive health, and nutritional projects. Half of these volunteers work in the AID-sponsored project intended to design a low-cost health care delivery system. Twelve community development volunteers work in various jobs around the country including agriculture extension, health education, latrine building, and handicraft development and marketing. Community development volunteers are also involved in introducing appropriate technology devices.

Four PCVs are doing energy use surveys for the AID-sponsored Renewable Energy Project. Two are working in the AID-sponsored fisheries project, designed to increase rural area protein sources.

Forestry is a new project proposed to start in late 1981. This project is designed to increase fuelwood availability and slow down the damaging ecological effects of progressive deforestation. It is a joint Peace Corps/AID proposal resulting from the Upper Volta Forestry Conference.

## Mauritania

There are presently 17 PCVs working in Mauritania in health and agriculture. In health, seven volunteers are working in MCH centers and four Mauritanians are undergoing training for the AID-sponsored Rural Medical Assistance Project. In agriculture, 10 volunteers work in vegetable production and rice cultivation, working with village co-ops and SONADER.

## Niger

Niger has the largest PCV program in the Sahel with 135 volunteers in 13 projects. Education is the largest project involving 49 volunteers. Nutrition education, with 19 volunteers, is the second largest project. Volunteers work with Nigerien health workers and monitor the health and nutrition status of children, provide nutrition and sanitation education to mothers, and work in centers where the severely malnourished are rehabilitated. In the health sector, 13 PCVs work in hospitals and dispensaries providing both professional health care and medical training. There are 10 forestry project volunteers who supervise public forest planning and administration, provide technical support for planting village woodlots for fuel or construction supplies, and supervise government plantation production. Other PCVs work in youth development, fisheries, pest control, agricultural research, and cooperatives. Five PCVs work in the AID-funded Range Management Development Project providing research information on current range conditions, important grasses, livestock growth, grazing conditions, and herd migration. Five PCVs are scheduled to work on the AID-funded Niamey Department Development Project. They will help farmers use techniques and methods learned at the agricultural training centers.

## Senegal

There are 130 PCVs in Senegal working in education, rural development, and health/nutrition. In rural development, 61 PCVs are living in small villages and working as rural animation agents. This project is partially supported by AID and CRS. In the health and nutrition program, 22 PCVs are involved in maternal and child health care and pilot projects in fisheries, rural mechanics, and forestry. The AID-funded fisheries project, involves seven PCVs stationed in the Fleuve region along the Senegal River. They operate a fisheries station and carry out fisheries extension activities. The forestry project is also AID-funded through Africare. It involves at least four volunteers who work with local counterparts to establish village nurseries and woodlots in areas where sufficient water is available.

Upper Volta

The Upper Volta program consists of 79 volunteers in nine projects. The largest project in Upper Volta is village reforestation with 27 volunteers. PCV foresters work in small-scale, village-based programs which encourage villages to plant, protect, and maintain trees for their own use. Volunteers work with extension agents in five to 10 villages, mobilizing and helping organize and plant reforestation plantations, shade and fruit trees, and windbreaks. Another major effort expected to increase in Upper Volta is training in rural agricultural schools. Other programs include digging village wells (funded by AID's Potable Water Project), AID-funded inland fisheries, geological prospecting, and game ranching. AID funds are also being used in a health/water sanitation project which began in early 1981.

A new project which began last year involves threee PCVs working in the AID-financed Semi-Arid Food Grain Research and Development Project. In addition, Peace Corps/Upper Volta has an Accelerated Impact Program grant from AID to implement a new fisheries project. The PCV Sector Grant will provide funds for small projects by Peace Corps and other PCVs.

emergency planning could be introduced at the village level. In order for such a program to be effective, it must be supported and designed, coordinated and used at the Ministry of Health level. Each national Ministry of Health should be approached individually when introducing a health emergency preparedness planning strategy in the Sahel.

In the area of emergency agricultural and livestock preparedness planning, there are several project-specific needs which have been identified. Again, any plans should be coordinated through each Ministry of Agriculture or Rural Development, but AID-funded projects can provide the vehicle to test the plans. In this regard, the importance of rural extension services and cooperatives cannot be underestimated.

## Extension

One of the principal tools required for dealing with drought-induced food deficits is accurate forecasting of crop production as early as possible in the crop year. Each of the Sahelian countries has programs for estimating grain crop production throughout most of its area. However, these programs focus on estimating total production from harvest time sampling procedures. This information is available only after harvest and several months are usually required to collect and analyze samples. The information is therefore, usually available too late to mobilize grain transfers from surplus to deficit areas, much less provide an opportunity to fill deficits with imports.

Yet since drought is the principal determinant of grain production, and rainfall amounts and distribution in the early growing season are frequently most critical, accurate rainfall reporting during the early production cycle can provide a useful estimate of whether the crop will be adequate, deficit, or surplus for any given area.

Since weather stations exist only in a few areas and at widely separated points, they do not provide a suitable vehicle for projecting crop production. However, extension agents generally have contact with every village. Through their own observations and consultation with farmers, they could provide useful information on rainfall and crop conditions as early as four to five months before harvest. This could provide a basis for projecting both the country's production and regional or even village production.

The extension service has not traditionally played such a role. By providing some training and explicitly including this role among other responsibilities, the extension agent could make an important contribution to a preparedness program for dealing with drought-induced problems.

## Cooperatives

The lack of local organizations that can participate with national organizations in mobilizing the population is an institutional weakness which limits Sahelian countries' ability to deal with emergency situations.

In most Sahelian countries, cooperatives have been organized to facilitate marketing and channel production inputs, equipment, credit, and so forth. Co-op management has remained largely in the hands of cooperative agents, although rural management was originally conceived as a temporary measure until the local population achieved an adequate level of managerial competence. The cooperative services' failure to train local management and gradually relinquish their hold on cooperatives is increasingly seen as a serious obstacle to decision making and self-management. Some countries have started training programs for cooperative managers as well as cooperative agents. Such training programs offer the cooperatives a role in dealing with emergency situations which could be accomplished at very litle additional cost. As the cooperatives become more independent and self-managed, they could eventually become the vehicle for dealing with emergencies at the local level in concept with national level organizations.

## Security Stocks

Each of the Sahelian countries except Cape Verde has started programs to achieve self-sufficiency in basic foods. However, except for Niger and perhaps Mali, none have been able to achieve this objective during the past five years of both intensive efforts and lack of a general widespread drought. While Sahelian countries, with some exceptions, could individually or as a region, produce enough basic food grains to satisfy demand during adequate rainfall years, any serious local or regional rainfall failure would produce serious deficits. Moreover, the trend toward changing food consumption, especially in urban areas, from native grains to wheat and rice creates increasing demands for imported food grain supplies.

In order to handle emergency food deficits resulting from drought and other causes, Sahelian countries have considered maintaining reserve and security stocks on a national as well as regional scale. The technical and economic feasibility of alternative schemes for such a program have been widely studied, both on a national and regional basis. The most comprehensive study is the FAO's, completed at the end of 1980.

In considering various options for establishing reserve and security stocks, several issues must be considered. These include:

- National versus regional stocks;
- Magnitude--absolute as well as relative between the two types;
- Investment costs for facilities;
- Costs of carrying inventories;
- Institutional arrangements, capabilities, and related costs;
- Transport and handling costs; and
- Establishing an effective information system to provide timely signals of probable deficiencies and surpluses.

Consideration must also be given to possible alternative arrangements to establish and maintain security stocks. Given limited Sahelian resources, donors will have to meet most of the cost. Given the program's long-term nature, long-term donor commitments will also be necessary.

Another concern relates to the Sahel's institutional capacity to manage such a system. The experience with several national grain boards does not lead to an optimistic outlook for effective management. It should be recognized, however, that many national grain board problems stem from policy issues rather than management difficulties.

Still another consideration is the possible impact of achieving relative food security on the governments' rural sector attitudes and policies. Although food security studies invariably emphasize the urgency involved with improving and increasing food production, there may be a governmental tendency to relax efforts to achieve greater production once they know the security system will come to the rescue.

## The Regional Seminar Approach

This study concludes that a regional disaster preparedness seminar, of the type OFDA normally gives, may not be appropriate at this time. While there is a good overall awareness of the drought hazard existing in the Sahel, the concept of emergency preparedness does not generally extend beyond coordinating food distribution. However, because of the generally inadequate infrastructure and lack of planning and trained personnel, a high-level seminar of this type may be premature. What might be preferable would be to focus on more limited activities with discrete objectives and identifiable tasks which could be accomplished

within a specified period of time. While not as broadly-based as a regional seminar, this type of strategy may be more appropriate to the situation in the Sahel and would constitute a more appropriate first step toward bringing the Sahel, to a greater awareness and capability for emergency preparedness.

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Project Rep.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|

## III. FOOD AND AGRICULTURE ORGANIZATION (FAO)

### a) Approved and On-going Projects

**RAF/71/268** — Development of Animal Production in the Districts of Assale and Serbewel, LCBC Programme — CMR, CHD, NER, NIR — Chad

The immediate project objective is to assist and train local herdsmen in all aspects of range and livestock management with a view to increasing livestock productivity. Activities include protection and improvement of pasture lands, animal health care, improvement of the cattle breed and use of oxen for traction in agriculture.

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| 876,383 | 213,389 | 309,124 | 152,002 | 277,890 | 129,758 | 982,763 | |

**RAF/71/269** — Four Agricultural Development Centres LCBC Programme — CMR, CHD, NER, NIR — Chad

The immediate objectives of the project are, on the basis of one agricultural development centre in each participating country: (i) to develop specified irrigated perimetres for cultivation - partly by small-scale farmers and partly by the centres themselves; (ii) to conduct applied research; and (iii) to extend modern cropping methods and improved seeds varieties to farmers.

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| 1,751,493 | 559,746 | 509,919 | 700,580 | 1,339,716 | 411,258 | 3,521,219 | |

**RAF/71/273** — Développement de la Pêche sur le Lac Tchad, LCBC Programme — CMR, NER, NIR, CHD — Chad

The immediate objectives of the project are to: (i) help LCBC to prepare a regional fisheries development plan and generally advise on policies in this field; (ii) help LCBC to identify investment opportunities for external financing; and (iii) create three centres for extension work with fishermen in order to introduce new fishing techniques.

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| 322,517 | 67,140 | 191,727 | 76,396 | 243,153 | 57,165 | 635,581 | |

**RAF/73/055** — Control of Drain-Eating Birds (Quelea-Quelea) Phase II — CMR, CHD, BEN, MLI, MAU, NER, NIR, SEN, UPV, IVC, SOM — Senegal

The objective is to assist the participating countries in carrying out bio-ecological studies on noxious birds, improving and developing effective and economic bird-control techniques. Phase I: RAF/67/082 and Phase III: RAF/77/047

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| 2,166,922 | 400,678 | 119,977 | (1,583) | 21,583 | - | 540,555 | |

**RAF/73/060** — Agricultural Development of the Senegal River River Basin (OMVS), Phase II — MLI, MAU, SEN — Senegal

The objective was to define and develop the agricultural potentials of the river basin and supply the necessary technical assistance. Phase I: RAF/68/114 and Phase III: RAF/79/030

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| 2,719,200 | 314,541 | 343 | (115,890) | 116,551 | - | 315,445 | |

**RAF/74/043** — Establissement d'une cellule de planification et de programmation de mise en valeur, Onchocerciasis Programme. — MLI — Mali (Onchocerciasis programme)

Each of the seven participating countries has been earmarked a sum of $500,000 to finance studies for use in the development of onchocerciasis-freed zones within its borders.

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| 38,743 | - | 216,219 | 2,714 | 151,628 | 90,877 | 461,257 | |

**RAF/74/052** — Development of Onchocerciasis Freed-Zones Onchocerciasis Programme — BEN — Benin (Onchocerciasis programme)

See above description and RAF/77/005 under IIE-execution.

| 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|
| - | 34,993 | 114,120 | 59,688 | - | - | 208,800 | |

Status Report, Regional Programme for Africa

FAO

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY Principal Project Rep.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|

a) Approved and In-going Projects (Cont'd.)

**RAF/74/056** — Ecole de Faune, Garoua, Cameroon — Francophone countries — Cameroon

The objective is to strengthen the school so as to enable it to provide training for French-speaking Africains in the management of wildlife, conservation and tourism.

| 399,675 | 91,280 | 60,713 | 19,446 | 59,600 | 63,685 | 284,733 |
|---|---|---|---|---|---|---|

**RAF/74/063** — Inventory of Resources and Formulation of Master Plan for Development of the Onchocerciasis-Freed Zones, Onchocerciasis Programme — GHA — Ghana

See RAF/74/043 for description of Programme.

| - | 97,836 | 149,479 | 163,565 | 89,120 | 500,000 |
|---|---|---|---|---|---|

**RAF/74/065** — Hydraulic Development of Pastoral Areas, LCBC Programme — CMR,CHD,NER,NIR — Chad

The objective is to develop a network of artificial wells and ponds for livestock watering. This project is coordinated with RAF/74/067.

| 350,934 | 201,091 | 327,992 | 200,828 | 112,008 | 56,770 | 887,479 |
|---|---|---|---|---|---|---|

**RAF/74/066** — Creation of Four Forestry Centres, LCBC Programme — CMR,CHD,NER,NIR — Chad

The immediate objective of the project is to develop proper forestry activities in the Basin through the build-up of one forestry centre in each of the four LCBC countries. The principal activity of the centres is reafforestation with advice and assistance of the project personnel.

| 149,104 | 84,821 | 149,343 | 101,249 | 155,000 | 128,000 | 618,713 |
|---|---|---|---|---|---|---|

**RAF/74/067** — Well-Drilling in the Conventional Lake Chad Basin LCBC Programme — CMR,CHD,NER,NIR — Chad

The immediate objectives are to drill a number of wells in support of other development activities in the region and to increase LCBC's technical capacity to carry out water-related activities.

| 52,398 | 88,398 | 247,419 | 32,959 | 257,005 | 144,480 | 720,221 |
|---|---|---|---|---|---|---|

**RAF/75/001** — Animal Trypanosomiasis Control Economic Assessment Training in Applied Research on Glossina Control in the Dry Savannah Areas — BOT,BDI,CMR,CHD,ETH, GAB,IVC,NER,NIR,SOM, ZAI,ZAM — Zambia

The project finances economic assessment, training of personnel at all levels in the fields of control and veterinary research and implementation of studies of applied research which have been undertaken.

| 104,452 | 74,892 | 52,320 | 436,821 | 366,396 | 460,649 | 1,391,380 | 97,869 |
|---|---|---|---|---|---|---|---|

**RAF/75/022** — West African Rice Development Association, "WARDA", Phase II — BEN,BAM,BUR,CMR,CAR, TCH,COF,GNI,MAU,NER, NIR,SEN,SIL,TOG,UPV — Liberia

The objectives of the project are to promote rice production within the countries of West Africa. These include increasing the quantity of rice production as well as improvement of quality, use of better varieties, introduction of rational production methods, implementation of phytosanitary controls, promotion of storage, and marketing of rice both within the member countries and outside.

| 631,802 | 206,174 | 221,496 | 177,[illegible] | 322,862 | 1[illegible] | 1,060,312 |
|---|---|---|---|---|---|---|

**RAF/76/009** — Establishment of an African Regional Aquaculture Centre — Region-wide — Nigeria

The objective is the establishment of a regional bilateral aquaculture centre through the expansion and rehabilitation of an existing centre based in Nigeria. It will provide for training and applied research and information regarding fresh and brackish water for junior and senior aquaculturalists.

| | | 62,369 | 104,439 | 140,574 | 307,982 | 119,1[illegible] |
|---|---|---|---|---|---|---|

Status Report, Regional Programme for Africa — FAO

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Project Rep.) | | | | | |
|---|---|---|---|---|---|---|---|---|
| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
| | a) Approved and On-going Projects (Cont'd.) | | | | | | |
| RAF/76/020 | Étude de l'infestation glossinaire en Côte d'Ivoire Onchocerciasis Programme<br>See RAF/74/049 for description of programme. | IVC | Ivory Coast | | | | |
| | - | 128,800 | 81,780 | 67,020 | 2,000 | 279,600 | |
| RAF/77/006 | Forest Industries Advisory Group for Africa (Phase II | Region-wide | Ethiopia (Liaison Office) | | | | |
| | The immediate objectives of the project are to provide specialized technical advisory services on a national, regional and sub-regional basis and, in particular, to assist the Governments, on request, in reviewing their policies and machinery for the development of forest industries, identifying, evaluating, formulating and promoting specific forest industry projects, and promoting the development of national technical, managerial, research and marketing capabilities and know-how. Executed in collaboration with ECA and UNIDO. | | | | | | |
| | 4,861 | 65,681 | 194,052 | 503,760 | 595,000 | 1.363.356 | 236,944 |
| RAF/77/033 | Strengthening the Control and Operational Research against the Red Locust (Phase II) | BOT,KEN,LES,MLW,SOI MOZ,SWA,UPT,UGA,ZAM | Zambia | | | | |
| | The objective is, through continued UNDP assistance to ensure the strengthening of the International Red Locust Control Organization (IRLCO) as an established institution which is capable of carrying out its assigned duties as a preventive tool against the red locust and to develop more effective and economical methods of control. The project is intended to aim towards more operational-oriented activities with respect to locating outbreak areas, spray campaigns and training of staff, rather than the more research-oriented activities which were undertaken during the first phase, RAF/72/013. | | | | | | |
| | 18,142 | 111,445 | 116,135 | 183,620 | 136,648 | 566,000 | |
| RAF/77/042 | Coordination of Cooperative Action to Reduce Bird Damage to Crops in Eastern Africa | ETH,KEN,SOM,UPT,SUD | Kenya | | | | |
| | The objective is to improve present methods of bird damage control and introduce new methods where possible through collaboration with USAID and the West German Technical Assistance Agency as regards their ongoing projects in the region as well as with FAO-assisted projects with a view to developing and implementing a granivorous bird reporting service. | | | | | | |
| | - | 129,286 | 588,230 | 388,750 | 418,930 | 1.521.186 | 58,[illegible] |
| RAF/77/047 | Technical Assistance at the Regional Level in Crop Protection against Damages by Grain-eating Birds (DCLALAV), Phase III | BEN,CMR,IVC,GAM,UPV, MLI,MAU,NER,SEN,CHD | Senegal | | | | |
| | The project will provide training programmes for DCLALAV staff as well as extension programmes to inform farmers of control methods. It will also allow for continued research in grain-eating birds and in better control methods. | | | | | | |
| | - | 112,667 | 224,614 | 528,165 | 466,379 | 1,321,825 | 44,150 |
| RAF/77/048 | Recherches opérationnelles sur le criquet pèlerin et les sautériaux en Afrique de l'Ouest, Phase II | BEN,CMR,IVC,GAM,UPV MLI,MAU,NER,SEN,CHD | Senegal | | | | |
| | Objectives: The long-term objective of the project is to assist DCLALAV in the prevention and control of the Criquet Pèlerin by intensifying research and introducing more efficient and economical methods. The immediate objectives are planning, executing and coordinating research on the Criquet Pèlerin in the region and the training of personnel. See RAF/77/047. | | | | | | |
| | - | - | 59,569 | 178,431 | - | 237,000 | |
| RAF/77/049 | Assistance à l'Organisation internationale contre le criquet migrateur africain (OICMA) | MOR,ALG,ETC,IVC,MRA, MLY,MLI,MAU,NER,NIG, UPT,SEN,SIL,CHD,TCH,ZAI | Mali | | | | |
| | The project will aim for improved locust preparedness through construction work and equipment deliveries and for better understanding of ecological and meteorological factors governing locust incidence and behaviour through research. | | | | | | |
| | - | [illegible] | 318,047 | 400,000 | 322,400 | 1,220,454 | |

24

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Project Rep.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|

a) Approved and In-going Projects (Cont'd.)

| | | | |
|---|---|---|---|
| RAF/78/002 | Regional Research Programme for the Control of Aflatoxin | IAM,MLI,NER,NIR,SEN, CHD | Nigeria |

The objective of this project is to strengthen the African Groundnut Council's research capabilities in the control of aflatoxin through the establishment and strengthening of laboratories, introduction of aflatoxin-resistant groundnut varieties, detoxification techniques and training of personnel.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| - | 096 | 42,141 | 552,375 | 198,368 | 793,220 | |

| | | | |
|---|---|---|---|
| RAF/78/013 | Fishery Research on Lake Tanganyika (Preparatory Assistance) | BDI,URT,ZAI,ZAM | Burundi |

Under the preparatory phase, a project document will be formulated, the extent and composition of fishery resources will be defined and ecological, technological and economic data will be provided and standardized on a regional basis.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| - | 38,413 | 120,036 | - | - | 158,449 | |

| | | | |
|---|---|---|---|
| RAF/78/027 | Pre-project Activities for the Establishment of a Regional Training Project for Development of Inland Fisheries in the Sahel | CHD,IAM,MLI,MAU, NER,SEN,UPV | Mali |

This preparatory assistance phase will allow for the finalization of a project document which will aim at establishing a Sahelian Regional Fisheries Training Centre to provide adequate infrastructure and manpower for the implementation of the Inland fisheries development plan in the Sahel.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| - | 19,203 | 15,436 | 14,314 | 35,500 | 84,953 | |

| | | | |
|---|---|---|---|
| RAF/78/030 | Assistance technique au Haut-Commissariat pour le projet régional de recherche agronomique et de développement agricole (CNTA), Phase III | MLI,MAU,SEN | Senegal |

The aim of this project is to select and introduce agricultural varieties and methods to increase productivity and to diversify the agriculture so as to profit the economy and the farmers of the region. Phase I: RAF/68/114 and Phase II: RAF/73/060.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| - | 172,476 | 290,830 | 565,129 | 433,982 | 1,462,417 | 40,890 |

| | | | |
|---|---|---|---|
| RAF/78/033 | Promotion for Agricultural Production Cooperatives in Developing Countries | SEN,URT,NIR,ETH | Hungary |

The development objective of this project is to assist developing countries to promote greater agricultural production by their small farmers and thus raise their standards of living through efficient agricultural production cooperatives by increasing total production per unit of land. It is essentially an "institution-building" type of project for training personnel to build up efficient agricultural production cooperatives in all types of rural pursuits.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| - | - | 126,000 | 126,000 | 117,000 | 369,000 | 36,000 |

| | | | |
|---|---|---|---|
| RAF/78/052 | Veterinary Training In Southern Africa, Identification Mission | ANG,BOT,LES,MLW,MOZ, SWA,ZAM | N.A. |

The purpose of the identification mission is to report on the current situation and future needs, indicating possible Government inputs, areas of joint action among the countries concerned and technical assistance requirements from external funding sources.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| | | 38,241 | 36,000 | -- | 74,241 | |

| | | | |
|---|---|---|---|
| RAF/73/057 | Advisory Group on Food and Agricultural Industries (Phase II) | Region-wide | Ethiopia (Liaison Office) |

The immediate objectives of the project are to advise Governments, industrial investment institutions, private industrial concerns and multi-national organizations on the viability of specific food and agricultural industries projects by conducting feasibility studies, review missions, etc. Special attention will be given to projects serving economic groupings of countries and to projects with export potential. Regional and sub-regional training workshops will also be organized. Phase I: RAF/70/020. Executed in collaboration with ECA and UNIDO.

| 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|
| - | - | 86,061 | 199,344 | 305,535 | 591,940 | |

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Project Ben.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|

a) Approved and In-depth Projects (Cont'd.)

**RAF/78/072** - Assistance à l'Unité de planification et de coordination de la Commission du Bassin du Lac Tchad — CMR,NER,NIR,CHD

Les objectifs immédiats du projet portent essentiellement sur le lancement du processus de planification, la mise en place d'une banque de données fiables pour les besoins de la planification, ainsi qu'une analise des études existantes et l'exécution d'une étude prospective pour le développement agricole du Bassin.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 121,720 | 166,410 | 288,130 | |

**RAF/79/018** Travelling Workshop for the Prevention of Food Losses — ETH,GHA,KEN,MLI,NER, NIR,SEN,URT,ZOG,ZAM — N.A.

The objectives are to impress the importance of accelerated programmes for the prevention of post-harvest losses; to acquaint officials of the region working in this field with other officials working in the same field in different countries; to evaluate regional priority needs for research and development work in post-harvest loss prevention programmes; to discuss training requirements and training programmes in this field.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | - | - | 90,300 | - | 90,300 | | |

**RAF/79/025** Desert Locust Emergency Assistance — CMR,CHD,GAM,IVC,MLI MAU,NER,SOM,UPV — N.A.

The first objective of the project is to contain the current locust plague. However,the immediate action necessary to strengthen national and regional capabilities for controlling the desert locust invasion must be interpreted as a first step on the road to reorganization of the desert locust scheme to avoid, in the future, the development of any new plague. During the present campaigns, all efforts must be made to train staff, to select control techniques and to take any measure leading to increasing the efficiency of the units and organizations on a longer-term basis. The amount shown below includes a total cost-sharing contribution of $958,000.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | - | 987,489 | 309,892 | - | 1,297,381 | | |

**RAF/79/033** Mano River Union - Agriculture, Forestry and Fishery Development, Preparatory Assistance — LIR,SIL — Sierra Leone

The purpose of the project is to assist the Mano River Union in formulating a plan of action and projects for development of the agricultural sector, including forestry and fisheries, for further cooperation between the Member States.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | - | 4,325 | 4,221 | - | 8,546 | | |

**RAF/79/046** Seminar on Planning and Management of Integrated Mechanical Forest Industries (Preparatory Assistance) — Region-wide — Czechoslovakia

The immediate objectives of the seminar are to provide to a number of Africans specialized insight into (i) the theoretical background of integration in mechanical forest industries and their forward and backward linkages, (ii) the methodology of planning and designing individual production units and integrated mills; and (iii) the methodology of model studies adapted to local conditions.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | - | - | 3,500 | - | 3,500 | | |

**RAF/79/066** The South West Indian Ocean Fisheries Project — KEN,URT,MOZ,MAG,SEI, SOM, MAR,SEY — Madagascar

L'objectif principal du projet est d'améliorer la capacité de chaque pays, d'élaborer et de mettre en oeuvre des politiques halieutiques dynamiques de manière à lui permettre d'accroître les bénéfices qu'il tire de l'exploitation des ressources au large des côtes à l'intérieur de sa zone économique exclusive.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 184,980 | | 184,980 | |

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Proj. Rep.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 | Total 1982-1986 |
|---|---|---|---|---|---|---|---|

a) Approved and On-going Projects (Cont'd.)

**RAF/79/071** — China Study Tours for Rural Training — BEN,BDI,CMR,C/I,CAF, CHD,PRC,GAB,GUI,GBS, IVC,MAG,MLI,NER,RWA, SEN,TOG,UPV,ZAI — China

The objectives of the project are: to provide study tours for rural training to China; to provide participants with knowledge of the basic theories and to demonstrate their implementation in practice where feasible, and to encourage participants to assess the process of agricultural and rural development; to provide a follow-up of training received through return visits to selected countries by Chinese agricultural workers from institutions involved in agricultural development to advise on adaptation of methodologies to conditions in participants' countries, where applicable.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 444 | 613,800 | 141,734 | 755,978 | |

**RAF/80/036** — Assistance to OICMA in control of the African Migratory Locust in the Lake Chad Basin — CMR,CAF,CHD,PRC,GAM, GHA,IVC,MLI,MAU,NER, NIR,SEN,SIL,TOG,UGA,UPV,ZAI — Chad

The objectives are to assist OICMA to delineate the extent and intensity of the present infestations of the African Migratory Locust with the view of destroying them; to reduce as much as possible the scale of the breedings in process in order to prevent further spread of the infestations in the countries presently affected and to the neighboring countries; to properly equip OICMA in order to discharge effectively the additional assignment of locust control at the invasion areas; and to assist in strengthening and training of National Crop Protection Services of countries presently affected (Chad, Cameroon, Nigeria) in the techniques of locust survey and control so that they can adequately support the control efforts of OICMA.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 34,350 | 60,680 | 95,630 | 143,200 |

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Status Report, Regional Programme for Africa — FAO

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Project Rep.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 |
|---|---|---|---|---|---|---|

b) Projects Completed in 1977-1979

**RAF/67/077** — Tick-borne Disease Control — KEN,UGA,URT

This project recently completed, carried out research on the cattle disease, East Coast Fever. The project, in cooperation with other projects made several scientific advances, among them the development of an efficient vaccination technique.

| 1,117,733 | 11,770 | - | - | - | - | 11,770 |
|---|---|---|---|---|---|---|

**RAF/68/444** — ECA/FAO Advisory Group on Forest Industries Development, Phase I — Region-wide — Ethiopia

See RAF/77/006, Phase II

| 508,217 | 89,258 | - | - | - | - | 89,258 |
|---|---|---|---|---|---|---|

**RAF/72/013** — Red Locust Research, Phase I — BOT,KEN,LES,MLW, SWA,URT,UGA,ZAM — Zambia

See RAF/77/033, Phase II

| 255,643 | 75,161 | - | - | - | - | 75,161 |
|---|---|---|---|---|---|---|

**RAF/72/020** — Food and Agricultural Industries Development (Preparatory Assistance) — Region-wide — Ethiopia

Continuation of the preparatory assistance is scheduled which is essentially intended for the identification and formation of regional inputs and a regional approach to the subject of food and agricultural industries. This project is executed in coordination and cooperation with ECA. Phase II: RAF/73/057.

| 42,341 | 5,453 | 56,938 | - | - | - | 62,391 |
|---|---|---|---|---|---|---|

**RAF/74/009** — Identification Mission for the Establishment of Regional Remote Sensing. — Sahel Countries — N.A.

This project supported a study mission in 1976, which made recommendations on how best to meet Africa's needs for receiving, processing and disseminating remote sensing data. Recommendations included the creation of an African Remote Sensing Council - later established - as well as of receiving stations and training/uses assistance centres.

| | 3,586 | - | - | - | - | 3,586 |
|---|---|---|---|---|---|---|

**RAF/74/016** — African Migratory Locusts, Phase II (OICMA — OICMA Member countries — Mali

The objective is to strengthen this subregional organization (OICMA) so that it can cope efficiently, together with national locust control agencies, with the threat of migratory locust.

| 385,170 | (648) | - | - | - | - | (648) |
|---|---|---|---|---|---|---|

**RAF/74/049** — Onchocerciasis-Free Zones, Strategy for Northern Togo Onchocerciasis Programme — TO — Togo

See RAF/74/043 for description of programme

| 311,116 | (74) | (39,436) | - | - | - | (40,336) |
|---|---|---|---|---|---|---|

**RAF/74/068** — Sarnia Livestock Extension, LTSS Programme — NER,CHD,NER,NIR — Chad

The project is linked with RAF/77/068 and is only treated separately for financial purposes.

| 31,386 | 31,101 | 56,237 | - | - | - | 87,338 |
|---|---|---|---|---|---|---|

**RAF/75/025** — Etudes pédologiques des Vallées de la Bougouriba et du Ioni — UPV — Upper Volta

See RAF/74/043 for description of programme

| 104,332 | 31,834 | (946) | - | - | - | 30,768 |
|---|---|---|---|---|---|---|

Status Report, Regional Programme for Africa — FAO

| PROJECT NO. | PROJECT TITLE | COUNTRIES COVERED | HOST COUNTRY (Principal Project Rep.) |
|---|---|---|---|

| Expenditures 1972-1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-1981 |
|---|---|---|---|---|---|---|
| | | | | | | |

b) Projects Completed in 1977-1979 (Cont'd.)

| | | | |
|---|---|---|---|
| RAF/76/008 | Crop and Post-Harvest Protection | Sahel countries | N.A. |

This project provided support to an inter-governmental consultation meeting on crop and post-harvest protection needs in the Sahel, held in December 1976. The meeting was one step in the development of a comprehensive crop protection programme later developed under the leadership of CILSS and the Sahel Club. UNDP contributes to several projects included in this programme.

| | | | | | | |
|---|---|---|---|---|---|---|
| 37,068 | 12,354 | (122) | - | - | - | 12,232 |

| | | | |
|---|---|---|---|
| RAF/77/052 | FAO Study Tours in China | UPT,GHA,CMR,KEN, SOM,ETH,NER | China |

(a) Organic Recycling
(b) Forestry Support
(c) Soil/Water Conservation

| | | | | | | |
|---|---|---|---|---|---|---|
| | 34,966 | - | 17,365 | - | - | 52,331 |

| | | | |
|---|---|---|---|
| RAF/78/028 | Centre de documentation de la Commission du Bassin du Lac Tchad<br>LCBC Programme | CHD,CMR,NER,NIR | Chad |

The project will provide a mechanism of collecting, processing, safeguarding and diffusing all documentation produced or to be produced on the Lake Chad Basin.

| | | | | | | |
|---|---|---|---|---|---|---|
| | - | - | 78 | - | - | 78 |

| | | | |
|---|---|---|---|
| RAF/78/045 | Assistance to Desert Locust Control Organization of East Africa (DLCO-EA)<br>Preparatory Assistance | ETH,KEN,SOM,URT UGA | N.A. |

The immediate objective of this project was the containment and ultimate suppression of the desert locust outbreak in the subregion.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 148,200 | 4,285 | - | - | 152,485 |

| | | | |
|---|---|---|---|
| RAF/78/056 | FAO Study Tour in China on: | | China |

(a) Irrigation, Drainage and Water Management
(b) Integrated Wood Processing Industries
(c) Processing Technology to Serve Agriculture
(d) Agricultural and Rural Training in Rural Areas

| | | | | | | |
|---|---|---|---|---|---|---|
| | - | 85,072 | 4,100 | - | - | 89,172 |

| | | | |
|---|---|---|---|
| RAF/79/012 | Study Tour and Training Course in China on Forestry Support for Agriculture<br>(French-speaking) | French-speaking | China |

The objective of the project is to exchange experience in the field of forestry support for agriculture. The principal subjects of the study tour and training course are under the following subjects: (i) technical; (ii) planning and organizational; (iii) training and extension.

| | | | | | | |
|---|---|---|---|---|---|---|
| | - | - | 117,402 | - | - | 117,402 |

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# ANNEX A

## PEOPLE INTERVIEWED

### AID

Bill Anderson, AFR/DR, Program Officer, Mauritania
Ed Costello, Officer in Charge, Niger, Upper Volta
David Dawson, AFR/DR, Program Officer, Upper Volta
Mike Huffman, AFR/DR, Program Officer, Niger
Gudrun Huden, OFDA
Yvonne John
Bill Kelly, OFDA
Paul Krumpe, OFDA
Dorothy Lovelace
Irving Rosenthal, USAID Mission Director, Niger
Willy Saulters, Desk Officer, Upper Volta
Joel Schlessinger, AFR/DE, Gambia and Senegal
Roger Simmons, AFR/DR, Program Officer, Mali
Glenn Slocum, AFR/DR, Program Officer, Cape Verde and Guinea Bissau
Jack Slusser, OFDA
Alan Van Egmond, OFDA

### UNDP

Albert Djemba, Area Officer, Senegal
Noel Eichhorn, Area Officer, Gambia
Ursula King, Area Officer, Niger, Mali
Esrome T. Kuruneri, Officer-in-Charge West Africa Division, Senior Area Officer, Nigeria, Ghana, Liberia
Ndedi Ngonga, Area Officer, Gambi and Mauritania
Tim Rotheimel, Assistant to the Administrator
Leon Segal, Director, West Africa Division
Kees Wejnen, Area Officer, Upper Volta, Cape Verde

### UNSO

Leonard Maynard, Deputy Director
Maxine Olson

### UNDRO

Ilhan Luten, Director, Liaison office

### UNICEF

Mahezent Hapte-Marian, African Section Emergency Operations, Program Officer, Africa Section
Robert Walker, Director, Emergency Operations

# ANNEX B

## AMERICAN PRIVATE VOLUNTARY AGENCIES WORKING IN THE SAHEL

AFL-CIO (African American Labor Center)
African-American Institute
Africare
American Committee for Cape Verde
American Friends Service Committee
American National Red Cross
American ORT Federation
Assemblies of God
Baptist World Relief
CARE
Catholic Medical Mission Board
Catholic Relief Services
Christian and Missionary Alliance
Christian Reformed World Relief Committee
Church World Service
Credit Union National Association
Damien-Dutton Society for Leprosy Aid
Educational Development Center
Family Planning International Assistance/Planned Parenthood
Ford Foundation
Foster Parents Plan
Goodwill Industries of America
Gospel Missionary Union
Helen Keller International
International Church Relief Fund
International Executive Service Corps
International Voluntary Services
Lions Clubs in the U.S.
Lutheran World Ministries
Lutheran World Relief
MAP International
Marist Missionary Sisters
Society of Mary
Mennonite Central Committee
National Council of Catholic Women
Near East Foundation
New Tribes Mission
Operation Crossroads
Opportunities Industrialization Centers International
Operation Crossroads
Oxfam America
Partnership for Productivity
Pathfinder Fund
Salesians of St. John Bosco
Save the Children Federation/Community Development Foundation
Seventh Day Adventist World Service
Southern Baptist Convention
Sudan Interior Mission
Summer Institute of Linguistics

United Church Board for World Ministries, United Church of Christ, Divisions of World Mission and World Service

United Methodist Committee on Relief

United World Mission
VITA
White Fathers of Africa
World Neighbors
World Rehabilitation Fund
World Relief Commission of the N.A.E.
World Relief Corporation
World Vision Relief Organization
Worldwide Evangelization Crusade
Young Men's Christian Association of the United States, International Division of the National Board

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ANNEX C

CAPE VERDE

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

| AGENCIES | Communications | Community Development | Construction, Housing & Planning | Cooperatives, Credit Unions & Loans | Economic & Development Planning | Education | Equipment & Material Aid | Food Production & Agriculture | Industrial Development | Medicine & Public Health | Nutrition | Population & Family Services | Public & Business Administration | Social Welfare | Women | Youth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| African-American Institute | | | | | | ● | | | | | | | | | | |
| American Committee for Cape Verde (TCHUBA) | ● | | | ● | | ● | ● | ● | | | | | | | | |
| Catholic Relief Services - U.S.C.C. | | ● | | | | ● | ● | | | | ● | | | | ● | |
| Church World Service | | | ● | | | ● | ● | ● | | ● | | | | | | |
| Salesians of St. John Bosco | | | | | | ● | | | | | | | | ● | | ● |
| United Methodist Committee on Relief | | | | | | ● | ● | ● | | ● | | | | | | |

Source: TAICH Country Report.

GAMBIA

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

| AGENCIES | Communications | Community Development | Construction, Housing & Planning | Cooperatives, Credit Unions & Loans | Economic & Development Planning | Education | Equipment & Material Aid | Food Production & Agriculture | Industrial Development | Medicine & Public Health | Nutrition | Population & Family Services | Public & Business Administration | Social Welfare | Women | Youth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The African-American Institute | | | | | | ● | | | | | | | | | | ● |
| Africare | | | | | | | ● | ● | | | | | | | | |
| Catholic Medical Mission Board | | | | | | | ● | | | ● | | | | | | |
| Catholic Relief Services - U.S.C.C. | | | | | | ● | | ● | | ● | ● | | | | | ● |
| Damien-Dutton Society/Leprosy Aid | | | | | | | | | | ● | | | | | | |
| Family Planning Internat'l Assistance | | | | | | | ● | | | | | ● | | | ● | |
| International Executive Service Corps | | | | | | | | | ● | | | | | | | |
| Near East Foundation | | | | ● | | ● | | ● | | | | | | | | |
| Operation Crossroads Africa | | | ● | | | | | | | ● | | | | | | ● |
| Opportunities Industrialization Centers International | | | | ● | | ● | | ● | | | | | | | | ● |
| The Pathfinder Fund | | | | | | | | | | ● | | ● | | | ● | |
| World Vision Relief Organization | | | | | | ● | | ● | | ● | | | | | | |
| Worldwide Evangelization Crusade | | | | | | ● | | ● | | ● | | | | | | |
| YMCA | | | | | | | | | | | | | | ● | ● | ● |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

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| AGENCIES | Communications | Community Development | Construction, Housing & Planning | Cooperatives, Credit Unions & Loans | Economic & Development Planning | Education | Equipment & Material Aid | Food Production & Agriculture | Industrial Development | Medicine & Public Health | Nutrition | Population & Family Services | Public & Business Administration | Social Welfare | Women | Youth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AFL-CIO (African-American Labor Center) | | | | | | PP | ● | | ● | ● | | | | | | |
| Missionary Sisters of Our Lady of Africa (S.A.) | | ● | | | | ● | | | | ● | | | | ● | | |
| African-American Institute | | | | | | ● | | | | | | | | | | |
| Africare | | | ● | | | | ● | ● | | ● | | | | | | |
| American Friends Service Committee | | ● | ● | ● | | | | | ● | | ● | | | | ● | |
| American ORT Federation | | ● | ● | | ● | ● | | ● | | | | | | | | |
| CARE | | ● | ● | | | ● | | | | ● | | | | | | |
| Christian and Missionary Alliance | | | | | | | ● | ● | | ● | | | | | | |
| Education Development Center | | | | | | ● | | | | ● | | | | | | |
| Family Planning International Assistance | | | | | | | ● | | | | | ● | | | | |
| Ford Foundation | | | | | | ● | | | | | | | | | | |
| Foster Parents Plan | | ● | ● | | | ● | | | | ● | | | | | | |
| Gospel Missionary Union | | | | | | ● | | | | | | | | | | |
| International Church Relief Fund | | ● | | | | | | ● | | ● | | | | | | |
| Lions Clubs in the United States | | | | | | | | ● | ● | ● | | | | ● | | |
| MAP International | | | | | | | ● | | | ● | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pathfinder Fund | | | | | | | ● | | | | | ● | | | | |
| Summer Institute of Linguistics | | | | | | ● | | | | | | | | | | |
| United World Mission | | | | | | ● | | ● | | ● | | | | | | |
| World Rehabilitation Fund | | | | | | ● | ● | | | ● | | | | ● | | |
| World Relief Corporation | | | PP | | | | ● | ● | | | | | | | | |
| World Vision Relief Organization | | | | | | ● | | ● | | | | | | | ● | |

Source: TAICH Country Report

MAURITANIA

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

| AGENCIES | Communications | Community Development | Construction, Housing & Planning | Cooperatives, Credit Unions & Loans | Economic & Development Planning | Education | Equipment & Material Aid | Food Production & Agriculture | Industrial Development | Medicine & Public Health | Nutrition | Population & Family Services | Public & Business Administration | Social Welfare | Women | Youth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The African-American Institute | | | | | | ● | | | | | | | | | | |
| Catholic Relief Services - U.S.C.C. | | | | | | | ● | | | ● | ● | | | | ● | ● |
| Direct Relief Foundation | | | | | | | ● | | | ● | | | | | | |
| Goodwill Industries of America | | | | | | | | | ● | | | | | ● | | |
| International Voluntary Services | | | | | | | | | | ● | | | | | | |
| Lutheran World Ministries | | | | | | | ● | ● | | ● | ● | | | ● | ● | ● |
| Lutheran World Relief | | | | | | | ● | ● | | ● | ● | | | ● | ● | ● |
| Marist Missionary Sisters | | | | | | | | | | ● | | | | | | |
| United Methodist Committee on Relief | | ● | | | | | | | | | | | | | | |

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| AGENCIES | Communications | Community Development | Construction, Housing & Planning | Cooperatives, Credit Unions & Loans | Economic & Development Planning | Education | Equipment & Material Aid | Food Production & Agriculture | Industrial Development | Medicine & Public Health | Nutrition | Population & Family Services | Public & Business Administration | Social Welfare | Women | Youth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AFL-CIO (African-American Labor Center) | | | ● | | | ● | | | ● | ● | | | | | | |
| The African-American Institute | | | | | | ● | | | | | | | | | | |
| Africare | | | | | | ● | ● | ● | | ● | | | | | | |
| CARE | | | ● | | | | ● | ● | | | | | | | | |
| Catholic Relief Services - USCC | | | ● | | ● | | | ● | | | | | | | | |
| Christian Reformed World Relief Committee | | | | | | ● | | ● | | | | | | | | |
| Church World Service | | ● | | | | ● | ● | ● | | | | | | | | |
| Darien Book Aid Plan | | | | | | ● | ● | | | | | | | | | |
| Lions Clubs in the United States | | | | | | | | | | | | | | ● | ● | ● |
| Lutheran World Relief | | ● | ● | ● | | ● | | ● | | ● | | | | | | |
| MAP International | | | | | | | ● | | | ● | | | | | | |
| Society of Mary (Province of Cincinnati) | | | | | | | ● | | | | | | | | | |
| Oxfam-America | | | | ● | | | | ● | | | | | | | | |
| Southern Baptist Convention | | | | | | ● | | | | | | | | ● | | |
| Sudan Interior Mission | | | | | | ● | ● | ● | | ● | | | | ● | | |
| United Church Board for World Ministries | | | | | | | ● | ● | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| United Methodist Committee on Relief | | | | | | | ● | ● | | | | | | | | |
| World Neighbors | | | | | | ● | | ● | | | | | | | | |
| World Rehabilitation Fund | | | | | | | | | | ● | | | | | | |

Source: TAICH Country Report.

SENEGAL

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

| AGENCIES | Communications | Community Development | Construction, Housing & Planning | Cooperatives, Credit Unions & Loans | Economic & Development Planning | Education | Equipment & Material Aid | Food Production & Agriculture | Industrial Development | Medicine & Public Health | Nutrition | Population & Family Services | Public & Business Administration | Social Welfare | Women | Youth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AFL-CIO African American Labor Center (AALC) | | | | | | ● | | | PP | | | | | | | |
| The African-American Institute | | | | | | ● | | | | | | | | | | |
| Africare | | | | PP | | | | ● | | ● | | | | | | |
| Assemblies of God | | | | | | ● | | | | | | | | | | |
| Baptist World Relief | | | | | | | | ● | | | | | | | | |
| Catholic Medical Mission Board | | | | | | | ● | | | ● | | | | | | |
| Catholic Relief Services - USCC | | ● | | | | | ● | ● | | ● | | | | | | |
| Credit Union National Association (CUNA) | | | | ● | | | | | | | | | | | | |
| Helen Keller International | | | | | | ● | | | | | | | | | | |
| National Council of Catholic Women | | | | | | | ● | | | ● | | | | | | |
| New Tribes Mission, Inc. | ● | | | | | | | | | ● | | | | | | |
| The Pathfinder Fund | | | | | | | | | | | | ● | | | | |
| United Church Board for World Ministries | | | | | | | | ● | | | | | | | | |
| United World Mission | | | | | | ● | | | | | | | | ● | | |
| World Vision Relief Organization | | | | | | | | | | ● | | | | | | |
| Y M C A of the U S | | ● | | | | | | | | | | | | ● | | ● |

UPPER VOLTA

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AFRICAN-AMERICAN INSTITUTE | | | | | | ● | | | | | | | | | | |
| AFRICARE | | ● | ● | | | ● | | ● | | ● | | | | | | |
| AMERICAN NATIONAL RED CROSS | | | | | | | ● | | | ● | | | | | | |
| BAPTIST WORLD RELIEF | | | | | | | | ● | | | | | | | | |
| CATHOLIC MEDICAL MISSION BOARD | | | | | | | ● | | | ● | | | | | | |
| CATHOLIC RELIEF SERVICES | | ● | ● | | | ● | | ● | | ● | ● | | | | | |
| CHRISTIAN & MISSIONARY ALLIANCE | | | | | | | ● | | | PP | | | | | | |
| FOSTER PARENTS PLAN | | ● | | | | ● | | | | | | | | | | |
| MAP INTERNATIONAL | | | | | | | ● | | | | | | | | | |
| MENNONITE CENTRAL COMMITTEE | | | ● | | | | | ● | | | | | | | | |
| OPERATION CROSSROADS AFRICA | | | | | | ● | | | | | | | | | | |
| OXFAM-AMERICA | | | | | | | | ● | | | | | | | | |
| PARTNERSHIP FOR PRODUCTIVITY | | ● | | | ● | ● | | | | | | | | | | |
| SAVE THE CHILDREN FEDERATION/ COMMUNITY DEVELOPMENT FOUNDATION | | ● | | | ● | | | ● | | | | | | | | |
| SEVENTH-DAY ADVENTIST WORLD SERVICE | | | | | | | | ● | | | | | | | | |
| SOUTHERN BAPTIST CONVENTION | | | | | | ● | | ● | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUDAN INTERIOR MISSION | | | | | | ● | | | | ● | | | | | ● | |
| SUMMER INSTITUTE OF LINGUISTICS | | | | | | ● | | | | | | | | | | |
| VITA | ● | | | | ● | ● | | | | | | | | | | |
| WHITE FATHERS OF AFRICA | | | | | | | | ● | | ● | | | | | | |
| WORLD NEIGHBORS | | | | ● | | | | ● | | | | | | | | |
| WORLD RELIEF COMMISSION OF THE N.A.E. | | | | | | | ● | ● | | | | | | | | |
| WORLD VISION RELIEF ORGANIZATION | | | ● | | | | | ● | | | | | | | | |