SAHEL DEVELOPMENT PROGRAM

Annual Report to the Congress

Agency for International Development

Washington, D.C.

February 1978

PN-AAG-490

E R R A T A S H E E T

There is no page number 24 contained in this text due to a mistake in the typing of the page numbers. This error does not effect the flow of the text.

Table of Contents

I. INTRODUCTION

A. Background

The Sahel Development Program refers to the U.S. participation in the long-term, comprehensive program to develop the Sahelian region of Africa under overall aegis of the Club du Sahel.

Members of the Club du Sahel are the eight Sahelian states (Chad, Mali, Mauritania, Senegal, Upper Volta, Niger, Cape Verde and the Gambia) that are members of CILSS[2] plus 12 bilateral and 8 multilateral donor organizations. The essential elements of the Program include:

-- comprehensive, long-term planning for the entire region: built around two phases:

  * Phase I priorities are directed to improving the capacity and productivity of existing resources (e.g., manpower and agricultural lands), planning for the development of the river basins and other water resources of the area and improving the health, education and nutritional status of the population.

  * Phase II is aimed at achieving self-sustaining economic growth and will focus on phased river-basin development, completion of major transport links, and expanded capacity for the export of livestock and agricultural products.

-- Concentration on overcoming primary constraints to development.

-- Joint Sahelian and donor project planning, design and implementation.

A.I.D., in response to Congressional direction has been a leader in establishing the long-term, multidonor program for the Sahel.

In Section 494B of the Foreign Assistance Act of 1975, the Congress specified that in developing the Sahel program process, the President shall:

-- consider international coordination for the planning and implementation of such a program.

-- seek greater participation and support by African countries and organizations in determining development priorities.

-- begin such planning immediately.

---

[1] For a full description of the Club du Sahel and a report on its progress see Annex A of this Report.

[2] The Permanent Interstate Committee for Drought Control in the Sahel.

In Section 121 of the Foreign Assistance Legislation of 1977, Congress:

(a) authorized the President to furnish assistance, on such terms and conditions as he may determine, for the long-term development of the Sahelian region. Assistance furnished under this section shall be in accordance with a comprehensive, multidonor development plan which calls for equitable burden-sharing with other donors and shall be furnished, whenever appropriate, in cooperation with an international coordinating mechanism.

(b) asked the President to prepare an annual report on the Sahel Development Program concerning the allocation of the United States contribution to the Program, the extent of the contributions from other donor countries, the effectiveness of the integrated effort through the Club du Sahel, and the progress made in achieving the objectives of the Program.

(c) authorized, beginning in Fiscal Year 1978, $200 million for the Sahel Development Program of which not more than $50 million may be appropriated in Fiscal Year 1978. Amounts authorized under this section are to remain available until expended.

This Report is submitted in response to the statutory requirement contained in Section 121(b) above. The Report addresses:

-- the above statutory requirements;

-- the implementation status of A.I.D.'s activities in the Sahel; and

-- information requested in Congressional Conference Reports of 1977 on the Sahel Development Program.

The Report also contains information on:

-- constraints, strategies and A.I.D. projects in each major sector (agriculture, human resources, health, ecology, and infrastructure);

-- the Club du Sahel (Annex A);

-- the economic situation of the Sahelian countries Annex B).

B. STATUTORY REPORTING REQUIREMENTS

The Allocation of United States Contribution to the Program

The allocation of the U.S. contribution to the Sahel Development Program will be $50 million in FY 1978 and it is proposed that in FY 1979, the U.S. contribution increase to $90 million.

The allocation of these funds by major sector, for FY 1978 and FY 1979 is given in Table I below. Table II below shows the allocation of funds by country and account from FY 1974 to FY 1979.

The Sahel Development Program does not obligate the United States to allocate a pre-determined amount to a fund or an international institution. Rather, the total to be allocated is determined by the amounts necessary to finance individual programs and projects. For A.I.D., each of these programs and projects has been and will continue to be presented to Congress in A.I.D.'s Annual Congressional Presentation.

Table I
Sahel Development Program
Allocation by Sector
($ thousands)

	FY 78	FY 79
Agriculture	24,895	34,799
Livestock	4,111	11,691
Fisheries	349	760
Human Resources	7,458	9,660
Health	2,370	14,300
Ecology	5,526	10,190
Transport	5,526	8,600
TOTAL	50,000	90,000

Contributions from Other Donor Countries

The Foreign Assistance Appropriations Act of FY 1978 provided $50 million for the Sahel Development Program with the restriction "that no part of such appropriation may be available to make any contributions of the United States to the Sahel development program in excess of 10 per centum of total contributions to such program."

Table II
U.S. Economic Assistance to the Sahel - FY 74 - 79
(Grants and Loans - in millions)

	FY 1974	FY 1975	FY 1976 (& TQ)	FY 1977	FY 1978 (estimated)	FY 1979 (proposed)
1. Cape Verde						
SDP	-	-	-	-	1.0	1.9
Regular	-	4.1	3.1	2.3	3.6	1.0
Drought	-	-	-	-	-	-
TOTALS	-	4.1	3.1	2.3	4.6	2.9
2. Chad						
SDP	-	-	-	-	4.6	6.4
Regular	-	-	0.7	3.4	1.4	-
Drought	2.2	3.8	2.1	3.2	0.4	-
TOTALS	2.2	3.8	2.8	6.6	6.4	6.4
3. Gambia						
SDP	-	-	-	-	1.0	1.8
Regular	0.1	-	-	-	-	-
Drought	-	0.7	-	-	-	-
TOTALS	0.1	0.7	-	-	1.0	1.8
4. Mali						
SDP	-	-	-	-	4.9	13.6
Regular	-	-	1.1	8.9	1.7	0.3
Drought	3.5	13.1	2.4	0.7	-	-
TOTALS	3.5	13.1	3.5	9.6	6.6	13.9

	FY 1974	FY 1975	FY 1976	FY 1977	FY 1978 (estimated)	FY 1979 (proposed)
5. Mauritania						
SDP	–	–	–	–	3.8	5.8
Regular	–	–	–	1.5	0.5	1.1
Drought	2.4	1.7	0.6	–	–	–
TOTALS	2.4	1.7	0.6	1.5	4.3	6.8
6. Niger						
SDP	–	–	–	–	8.9	9.9
Regular	–	–	0.1	3.7	3.7	1.7
Drought	2.8	0.1	6.3	0.4	–	–
TOTALS	2.8	0.1	6.4	4.1	12.6	11.6
7. Senegal						
SDP	–	–	–	–	6.7	7.8
Regular	–	–	–	8.4	2.0	1.9
Drought	4.4	7.2	1.2	–	–	–
TOTALS	4.4	7.2	1.2	8.4	8.7	9.7
8. Upper Volta						
SDP	–	–	–	–	2.5	8.4
Regular	–	–	0.8	3.8	2.3	0.4
Drought	2.9	5.1	0.7	–	–	–
TOTALS	2.9	5.1	1.5	3.8	4.8	8.8
9. Sahel Regional						
SDP	–	–	–	–	19.6	34.4
Regular	2.8	1.6	13.3	12.1	2.1	0.7
Drought	4.2	5.0	5.9	3.0	–	–
TOTALS	7.0	6.6	19.2	15.1	21.7	35.1
TOTAL SAHEL	24.4	42.4	38.3	51.4	67.8	97.1
SDP	–	–	–	–	50.0	90.0
Regular	2.0	5.7	13.1	44.1	17.4	7.1
Drought	22.4	36.7	23.2	7.3	0.4	--

Table III below provides information on the level of official development assistance to the Sahel between 1974-1979.

For the years 1974-1976, the statistics of the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) have been employed. These statistics were especially prepared at the OECD, by the Secretariat of the Club du Sahel, for the second meeting of the Club du Sahel which took place in the Spring of 1977.

For the period between 1977 and 1979, the Secretariat of the Club du Sahel has projected the levels of development assistance to the Sahel. For these projections, the Secretariat has incorporated (1) previous levels of assistance, and (2) public commitments such as those made by the representatives of donor organizations at the second meeting of the Club du Sahel.

At the bottom of Table III, the U.S. contribution to the Sahel is given as a percent to total contributions. This information is provided to demonstrate that A.I.D. is adhering to the statutory provision limiting the U.S. contribution to no more than 10 percent of total contribution to the program. For 1978 and 1979, it is projected that the U.S. will provide respectively 6.1 percent and 8.1 percent to the program.

Table III
Commitments of Development Assistance to the Sahel
(in millions)

	ACTUAL		ESTIMATED		PROJECTED	
	1974	1975	1976[2]	1977	1978	1979
Belgium	6.5	6.1	6.0	6.5	7.0	8.0
Canada	29.0	65.3	50.0	60.0	75.0	75.0
France	185.0	222.5	236.8	238.0	240.0	240.0
Germany	76.0	76.7	72.0	90.0	110.0	118.0
Netherlands	2.5	8.4	35.0	36.0	38.0	40.0
Switzerland	2.4	3.2	3.1	6.0	8.0	10.0
United Kingdom	7.3	5.1	12.7	13.0	14.0	15.0
European Economic Community	157.4	148.4	176.9	140.0	145.0	150.0
IBRD	42.3	107.9	110.3	150.0	180.0	200.0
U.N.	40.0	52.8	22.6	40.0	50.0	50.0
African Development Program	16.5	46.7	44.6	45.0	50.0	55.5
OPEC	83.7	91.2	75.9	90.0	100.0	120.0
Other DAC Member Countries[1]	12.3	10.3	3.3	18.0	16.0	20.0
United States[3]	2.9	5.7	11.5	36.0	67.4	97.1
TOTAL	$663.8	$850.3	$860.5	$968.5	$1,100.4	$1,198.1
U.S. as Percent of Total	0.4%	0.6%	1.3%	3.7%	6.1%	8.1%

1 - Austria, Australia, Denmark, Finland, Italy, Japan, Norway and Sweden
2 - Based on preliminary data.
3 - Does not include emergency or drought related assistance, but does include SDP and functional assistance.

The Effectiveness of the Integrated Effort Through the Club du Sahel

The Club du Sahel has demonstrated the ability to promote integrated strategy development and planning, as well as project design and implementation.

-- The development of integrated sector strategies and plans. The Club du Sahel, through its various multidonor/Sahelian working teams have prepared an initial delineation of integrated sector strategies and plans. These strategies and plans are based on an analysis of the constraints and prospects in each of the major sectors. From this analysis the teams produced sector specific strategies and identified individual projects to implement these strategies.[1] To further the integration process, the Club du Sahel, in its May 1977 document, "Proposals for Drought Control and Development Program and Strategy for the Sahel," wove the individual sector strategies into an overall plan for Sahelian development. (Annex A contains more complete description of this plan.)

-- The development of integrated programs and projects. The Club du Sahel's Crop Protection Program illustrates the ability of the Club to promote integrated project design and implementation on a multi-national basis. In the analysis undertaken by the working team, it was recognized that protecting basic food crops, while growing and in storage, would significantly contribute to food self-sufficiency. The analysis indicated that to accomplish this, it would be necessary to strengthen the national crop protection services of the Sahelian countries, undertake integrated research activities to protect crops against the pests and post-harvest crop loss and to create a regional training and information center. It was also recognized that while the focus of activity for the program would be at the local level, integrated regional planning and implementation would be essential for the success of the program.

Once general agreement had been reached regarding the importance of the program and its essential components, the Club proceeded to activate teams comprised of Sahelian and donor experts to design the program. All of the Sahelian states and experts from more than ten assistance agencies participated in the actual design.

Since a program of this magnitude may be beyond the means of any one donor to finance (it is estimated that the program will cost $78 million over five years), coordinated multidonor funding was necessary. This has been achieved through the Club du Sahel.

---

[1] Known as first generation projects.

Commitments totaling the required $78 million have been received from West Germany, France, Canada, the United Kingdom, UNDP, Denmark, Norway, the Arab Bank for African Development, and the United States.

Progress Made in Achieving the Objectives of the Program

The ultimate objectives of the international Sahel Development Program are regional food self-sufficiency and sustained socio-economic development while maintaining ecological balance. Achieving these goals will require long-term commitments by all concerned, focused on a broad range of development constraints.

In the short-term, e.g., three to five years, forecasting specifics of progress may prove difficult given the:

-- long lead time required between project identification, design, implementation and the realization of final project results;

-- potential repeat of a major drought; and

-- lack of accurate data on basic factors such as per capita income, income distribution, mortality and morbidity, productivity per unit of land, and literacy rates.

While it is too early to point to specific progress made achieving program goals, each of the sector statements in this Report describes concrete measures taken by A.I.D. in concert with other donors to:

-- improve small farmer agricultural productivity as a means to increase per capita incomes and income distribution;

-- extend health services to the rural population in order to increase life expectancy, reduce infant mortality and improve nutrition;

-- increase both literacy rates through non-formal educational programs;

-- improve land productivity through the introduction of improved seed, fertilizer and animal traction;

-- reduce the consequences of future droughts through reforestation programs; and

-- improve institutional capacity.

In the medium-term signs of physical progress in the Sahel which can be clearly attributed to the international program are projected to be:

- an increase in the number of persons employed and a decrease in under-employment;
- expansion in the feeder road system and rehabilitation of existing feeder roads;
- increased numbers of rural markets and improvements and expansion of existing markets;
- improvements and increases in the education facilities;
- construction under way for some major dams and transport links.

At the village level there will be:

- improved and increased infrastructure, e.g., schools, dispensaries and community centers;
- increased availability of potable water;
- improved communication facilities;
- access roads to market centers;
- increased availability of consumer goods at African-owned and operated outlets.
- some increase in African-owned and operated, small-scale commercial ventures, e.g., machine shops, manufacture of agricultural tools, and commercial wood lots;
- improved farmer skills including irrigated farming.

Areas in which there will probably be little or no change during the first decade include:

- population growth rates;
- major infrastructure schemes completed;
- elimination of the threat of famine as a result of a major drought.

C. A.I.D.'s IMPLEMENTATION OF THE SAHEL DEVELOPMENT PROGRAM

Medium-Term Projects

Funds to finance projects under the Sahel Development Program first became available to A.I.D. in October 1977 when Section 121, of the Foreign Assistance Act, went into effect.

During the period immediately following the great drought, FY 1975-FY 1976, A.I.D. activities in the Sahel were funded from the Special Drought Appropriation and are known as medium-term projects.

These medium-term projects, which focused on food production and livestock, provided an effective and important means for addressing critical development problems pending the establishment of the Club program.

"Medium-term" projects now being implemented by A.I.D. include:

-- the Cereals Production project in Niger which is entering its third year. This project helps to increase food production through an improved national system of seed multiplication and distribution, field demonstrations, and training. To date, over 5,000 agricultural demonstrations have been conducted by "farmer demonstrators" under the guidance of extension technicians. Warehouses and offices have been constructed for the Nigerien Credit and Cooperative Organization and three of five proposed seed multiplication centers are in operation.

-- the Cereals Production Project in Senegal which provides support to SODEVA, an agency responsible for the development of the countries millet-groundnut basin. With A.I.D. funding, SODEVA is intensifying crop production by introducing animal plowing, new varieties, crop rotations, and fertilizers into an area of the groundnut basin that had not previously been reached. Under this project, a special applied research and extension liaison office was established in the Senegalese Institute for Agricultural Research (ISRA) to develop and evaluate SODEVA's programs. The Research and Extension Liaison Office links SODEVA's field operations to ISRA's applied research. Consequently, the technologies extended can be assessed and tailored to the requirements of the farm population. The success attained by this project is due to the organizational effectiveness of SODEVA as a regional development and extension agency.

-- The Seed Multiplication project in Upper Volta provides assistance to national and regional seed multiplication services. Under this project, A.I.D. has financed assistance in the form of farm equipment, vehicles, fertilizer and operating funds for nine seed production sites. In FY 1977 ten extension supervisors participated in a short course in seed science at the National Agricultural School in Matourkou. In addition, 11 agricultural technicians from various Regional Development Organizations (ORDs) participated in a four month course in crop production and seed multiplication at the International Institute of Tropical Agriculture (IITA) in Nigeria. The Director of the National Seed Service received three months' training in seed multiplication at Mississippi State University.

-- The Regional Sahel Food Crop Protection project is increasing the capacity of plant protection services in Senegal, Chad, Mauritania, the Gambia and Cape Verde. A.I.D.-financed technicians are now in three of the countries and training materials for local centers are being completed. A Regional Training Center in Dakar is under construction and commodities have been used by the countries to control heavy pest infestations during the recent crop year. Over 20 participants have received short-term training in improved plant protection methods.

-- The Range and Livestock project in Chad provides a range management advisor to the Ministry of Rural Development and a professor of range management to the national university. Ten Chadian technicians have visited Kenya and the United States to observe livestock production practices. In-service training programs are being provided for personnel of the livestock service and 11 participants are enrolled in U.S. institutions studying range management, veterinary medicine, and botany.

-- The Livestock Sector project in Mali offers a comprehensive approach to improving livestock production and marketing. A 12-man team is now working in the Sahelian area to implement a village-based range management and communications program in an area of approximately 1 million hectares. This year, over 500 farmers throughout the country are participating in a highly successful, small farmer, cattle-fattening activity. Concurrently, the results of a tse-tse fly research program will open new lands to create a cattle production and marketing corridor to the markets in the south.

Projects Funded from the Functional Accounts

Beginning in FY 1974, A.I.D. projects in the Sahel were increasingly funded from the regular functional accounts. To date over $70.0 million has been obligated for such projects. These projects are described under each of the sector statements in this Report.

Implementing Bilateral Projects in a Multidonor Context

The Club du Sahel serves as an effective mechanism for strengthening all bilateral assistance programs in the Sahel. The Club can address sector-wide constraints on an integrated basis and then marshall the necessary design and financial resources to address these constraints.

Within this context, A.I.D. can extend the benefits of its assistance far beyond what would be possible within a more conventional approach. For example, it is doubtful if a single donor would be able to mobilize the talent and resources necessary to mount a successful reforestation program in the Sahel. Through the Club du Sahel, such a program is feasible and in fact, is now being designed and will be implemented in a multidonor context. A.I.D. plans to participate along with other donors in this program, and similar programs in rural roads, crop protection, and river basin development.

In the reforestation program and in other such large-scale undertakings, A.I.D. resources will, for the most part, be transferred on a bilateral basis through individual projects implemented in each Sahelian country. In all cases projects will follow A.I.D.'s normal implementation procedures and will be audited and evaluated as are all Agency bilateral projects.

Implementation Progress

Implementing development projects in the Sahel can be difficult. Constraints include:

-- the limited technical, management and financial resources of the Sahelian states;

-- short growing seasons, highly variable rainfall and cyclical periods of drought; and

-- lack of adequate infrastructure.

In spite of these problems, A.I.D. and other donors have managed to make substantial progress in the implementation of its Sahel program. Indicators of A.I.D.'s progress include:

— identification, design, and implementation of over $54.5 million worth of medium-term activities in the Sahel between FY 1974 and FY 1977.

— establishment and staffing of A.I.D. field posts in Mali, Chad, Mauritania, Niger, Upper Volta and Senegal;

— the results of the medium-term projects on increasing food production, training of technicians and farmers and strengthening Sahelian institutional capacity (cooperatives, extension services and research organizations).

D. INFORMATION REQUESTED IN CONFERENCE REPORTS

The committee reports regarding the Sahel Development Program request that the Annual Report address certain specified issues. These issues are addressed below:

Infrastructure [1]

Analyses of development prospects in the Sahel undertaken by the Club as well as by FAO, the Massachusetts Institute of Technology, the World Bank, and UNDP point to the lack of adequate infrastructure as a key impediment to economic development.

Identified as infrastructure needs are smaller infrastructure works such as rural roads, markets, wells and other village-level facilities. In addition, major infrastructure works such as dams, secondary and primary road links, ports, and national food storage facilities systems are recognized as essential to Sahelian development.

The recently completed Sahel Road Maintenance Diagnostic Study, undertaken by the Club du Sahel, noted that almost all of the 57,993 kilometers of secondary and feeder roads in the region are merely improved tracks, and that the great majority are in very poor condition. Estimates also indicate that only a very small percentage of the irrigable land in the Sahel is currently irrigated through controlled irrigation projects, even though over 3,000 kilometers of major rivers flow through the Sahel. At the village level, the lack of adequate infrastructure in villages is evidenced by the absence of potable water systems, sanitation facilities, and local markets.

While A.I.D.'s FY 1978 and 1979 Sahel Development Program is limited to financing smaller infrastructure works. A.I.D. is participating with other donors in the planning and institutional support relating to major infrastructure projects in the Niger, Senegal, Gambia Rivers and Lake Chad. (The Agriculture Sector statement of this Report describes A.I.D. activities in these areas.)

---

[1] Section II,E of this Report provides information on infrastructure needs and plans.

While the Agency is not proposing FY 1979 financing for any major infrastructure activities, A.I.D. participation will probably entail joining with other donors in the financing of such infrastructure in the near future. Before proceeding with such financing, A.I.D. will consult with Congress.

Promoting Ecological Balance

The overall strategy to promote ecological balance, and A.I.D. efforts which support this strategy, are detailed in the Ecology Sector statement of this Report.

Local Government Commitment

The extent of local government commitment to support the Sahel Development Program projects is specifically delineated on the project data sheets in the Africa portion of the Agency's Presentation to the Congress. Some examples are:

-- The Gambia Reforestation project in which total A.I.D. inputs amount to $1,500,000, while the contribution of the Government of the Gambia amounts to $1,160,000, or 43.6 percent of life of project funding. Their contribution is in the form of personnel, facilities, and operating expenses.

-- In Senegal, the Small Irrigated Perimeters project involves A.I.D. inputs of $5,859,000 while the contribution of the Government of Senegal totals $1,800,000, or 23.5 percent of life of project funding. Their contribution is in the form of staff and agricultural inputs, farm infrastructure, and administrative expenses.

-- Also in Senegal, the Rural Health Services project involves A.I.D. inputs of $3,435,000 while the contribution of the Government of Senegal amounts to $1,040,000, or 23.3 percent of life of project funding. Their contribution is in the form of personnel, operating expenses, and the construction of six dispensaries.

-- In Upper Volta, the Rural Water Supply project involves A.I.D. inputs of $12,280,000 while the contribution of the Government of Upper Volta amounts to $2,400,000, or 16.4 percent of life of project funding. Their contribution is in the form of staff facilities and support costs for that area of Upper Volta where A.I.D. will implement its project.

II. Sector Statements

A.I.D. is participating in the Sahel Development Program through bilateral and regional projects that seek to achieve the Club du Sahel goals of food self-sufficiency, self-sustained socio-economic development, while promoting ecological balance.

The Agency's participation in the Program will be directed toward projects designed to improve the well-being of the rural population -- to increase farmer income, improve nutrition and health, promote human resource development and seek ecological stability.

Each of the following sector statements -- agriculture, human resources, health, ecology and infrastructure -- delineate the:

-- major constraints in each sector;

-- overall Club du Sahel strategy to surmount these problems; and.

-- specific A.I.D. projects being undertaken to implement these strategies.

A. Agriculture, Livestock and Fisheries

Constraints

Agriculture and livestock development are central to achieving Club goals and strategies for food self-sufficiency and self-sustaining economic development in Sahelian countries. Not only must the agricultural sector provide means to supply a growing population with adequate nutrition, but it must also provide employment for the rural people. In addition, agricultural commodities are important for generating foreign exchange.

To increase food production and generate employment and income in rural areas, the following difficult constraints must be overcome:

- low and declining crop and labor productivity;
- inadequate marketing and storage policies;
- inadequate price incentives;
- low productivity per animal and per unit of grazing land;
- insufficient attention to carrying capacity of communal range-lands;
- inefficient livestock marketing systems; and
- ineffective institutions serving agriculture and livestock development.

The productivity of Sahelian agriculture is low and declining. The major factors responsible for this poor productivity performance in Sahelian agriculture are poor and/or declining soil fertility, vulnerability to pests and weather variability.

Population pressure has either caused marginal lands to be brought into cultivation or has caused overfarming and reduction of the fallow time required to restore natural fertility. Overfarming is particularly serious in such densely populated areas as the Mossi plateau in Upper Volta and the millet-groundnut basin in Senegal.

In the period immediately following the great drought, a widespread invasion of grain-eating birds, locusts and rodents caused unusually severe grain crop diseases and losses.

Grain yields vary by ecological zone, the lower the expected annual rainfall the higher the yield variability. Although traditional grain

crops have been selected for their resistance to drought, vulnerability to drought is a major problem in the Sahelian countries and agricultural research is needed to develop shorter cycles, drought-resistant, high yielding varieties of grains.

Inadequate incentives to encourage the use of fertilizers, improved seeds and other modern inputs. Government policies have generally not provided incentive for farmers to increase food production. Official producer prices, established by governments for major cereals, compare favorably with "world" market prices but cannot be maintained effectively at the farm level because of inadequate storage facilities, transportation networks, communications and management capability.

It is difficult to establish appropriate price or input-subsidy policies at the present time due to inadequate data on basic factors which influence farmer's production decisions and attitudes toward risk. A number of Sahelian countries have established marketing boards to regulate grain prices and trade, but these organizations tend to discriminate against producers in favor of urban consumers. This reflects the lack of capacity by Ministries of Planning or Rural Development, in Sahelian countries, to assess the costs and benefits of more equitable agricultural development policies.

The Sahelian capacity to carry out research on complex technical, biological, economic, and social problems in agriculture is limited. Agricultural research could contribute to the development of profitable technologies to increase agricultural output and farm income. There exists an overriding need to build national capacity in agricultural research, which is reflected in the growing interest of Sahelian countries to strengthen their national research organizations. As recently as 1972, agricultural research focused upon export rather than food crop protection, although attention is now turning to food (and livestock) production problems in the Sahel.

Extension services are unable to respond to farm-level problems. There prevails a common view throughout the Sahel that the rural population must be directed at every turn and is unable to participate in decision-making. This view is predicated on the notion that farmers are ignorant, unable to identify their own farm-level problems, and totally unresponsive to change. Consequently, agricultural extension in the Sahel is largely a matter of controlling and supervising the introduction and adoption of new varieties and/or techniques.

Peasant farmers in the Sahel have become the objects, not the agents of agricultural development. While this approach has been successful in increasing the production of some commodities, notably peanuts and cotton, it apparently has failed to result in self-generating growth through farmer initiative. In contrast, the degree of local initiative in vegetable production and other areas generally neglected by the Sahelian

governments, is impressive.

Thus, while the centralized agricultural extension structure may adequately provide inputs for farmers and support to extension agents, concurrently this same structure discourages independent, innovative efforts to adapt to local requirements and demands. Although extension agents are in direct contact with farmers when introducing improved production techniques, the rigid organizational hierarchy obliges the agents to be more responsive to administrative requirements than to farmers' problems.

There is limited carrying capacity of communal rangelands. In the period 1950-1968 which preceded the drought, livestock numbers increased rapidly (3-5 percent per year). This unprecedented growth was made possible by an extended period of favorable rainfall, the control of the major communicable diseases through donor-supported vaccination campaigns and the development of additional permanent water resources. By the mid-1960's, the numbers of livestock exceeded dangerously the medium to long-term carrying capacity of the communal rangelands. As a result, the drought caused severe stock mortality in flocks and herds (20-40 percent being common), disrupted the subsistence base of many families, and accelerated the deterioration of the range.

Existing livestock marketing systems are counter-productive. The high costs and efficiencies of the present livestock marketing system, which involves trekking animals over long distances to markets, constrains the modernization of the sector. The result is reduced income to herders and lowered balance of payments for Sahelian governments. Livestock and meat products marketed through this system to coastal countries no longer appear to be competitive with imports from outside West Africa.

Agricultural education and training is largely theoretical. Agricultural education and training at all levels parallels and reinforces the paternalistic and non-adaptive approach of the extension services. Professional agricultural training is too academic and does not sufficiently prepare extension personnel for what they will find in the farmers' fields. Most schools lack even the most basic educational materials, teaching supplies and infrastructure. Teachers, who themselves are often poorly trained, lack libraries and have no access to documentation for lesson preparation. Consequently, professional level agricultural and livestock training in the Sahel isolates extension agents from the realities of agricultural and livestock production and their future job demands.

Elements of the Club Strategy - Agriculture

Introduction

The Club du Sahel strategy for agriculture emphasizes three main themes:

-- raising productivity of land already under cultivation.

-- development of the underexploited potential of sparsely populated "new lands", including vast areas of underutilized lands lying within the watersheds of the three major and two minor river basins of the Sahel.

-- developing the capability of Sahelian institutions at the regional and national levels to effectively plan, manage and evaluate their development programs.

Raising Land Productivity

Raising productivity through intensification of production on land presently under cultivation involves intensification under two quite different farming systems -- rainfed and irrigated agriculture. Attainment of food self-sufficiency in basic foods by the year 2000 will depend on expanding production of traditional rainfed crops, despite their vulnerability to climatic hazards. Even under the most optimistic assumptions for the development of irrigated agriculture, between 75-80 percent of Sahelian food will be produced under dryland conditions by the year 2000. The Club has recommended a series of interventions for increasing productivity of rainfed lands. While specific recommendations vary according to agro-climatic zones, the basic elements of the rainfed strategy include:

-- Disseminating improved varieties...the Club has recommended a research and seed multiplication program for sorghum, millet and legumes to improve crop yields and resistance to drought.

-- Cultivation and Fertilization...the Club has outlined a program to test improved methods of manual as well as animal and mechanical cultivation, coupled with efforts to introduce rational crop rotation systems and the application of chemical or organic fertilizers.

-- Agricultural techniques...the Club has recommeded extension of a program to encourage adoption of proper cropping techniques (ploughing, rotation, weeding) as a further means of increasing the productivity of traditional farming.

-- Crop Protection...the Club has advanced a comprehensive program to control crop pests and diseases. Implementation of this strategy is expected to increase productivity in the rainfed sector between 1 and 4 percent per year depending on the crop, increased employment, and labor productivity in rural areas.

— Irrigated Agriculture...the Club's crop intensification strategy also devotes attention to the possibilities for increasing production under existing, irrigated agriculture systems in the Sahel. Of the 165,000 hectares of irrigated agriculture in the Sahel, over 60,000 hectares are producing well below worldwide averages. For example, rice yields represent only 24 percent of those attained in Asian countries. Many of these irrigation systems have been abandoned or have deteriorated to the point where they can hardly be classified as functioning irrigation systems. The CILSS has advanced a five-year program of irrigation system rehabilitation coupled with creation of farmer controlled associations to operate and maintain the rehabilitated systems.

New Lands and River Basin Development

New Lands

The Club agricultural strategy asserts that the greatest gains for production in the short-term may be achieved through intensification of production, both dryland and irrigated, on presently cultivated lands. The Club recognized that over the long-term there will remain considerable "new lands" which could be settled and developed. Settlement of new lands, such as those opened up by the River Blindness Control Program, would serve to relieve pressure in some of the more densely populated areas, e.g., Mossi Plateau in Upper Volta and the groundnut basin in Senegal, and would expand the agricultural production base of the Sahelian states.

The opening up of new lands on an extensive basis is a long-term proposition given the complex endemic disease and population resettlement problems which must be resolved before new lands can be effectively brought into production. Thus, the Club's new land strategy places great emphasis on data generation and planning over the next several years, deferring to the future consideration of extensive new land investment programs.

River Basins

River Basins constitute a special category of new lands. The three major (Niger, Senegal and Lake Chad Basins) and two minor (Gambia and Volta) international river basins hold the key to development of irrigated agriculture in the Sahel.

These basins account for the majority of the two million hectares of potentially irrigable and untapped agricultural soils in the Sahel. Recognizing this potential, Sahelian governments have organized regional

river basin planning commissions for most of the river and lake basins. Organization of these planning and regulatory bodies by the riparian states arises not only from a recognition of the agriculture, power, and transport development potential of the basins but also from the recognition that mismanagement of these hydrological resources could destroy this great natural resource of the Sahel. Since no single donor would finance a program of this magnitude, the UNDP, acting on behalf of the Club du Sahel over the past 12 months, organized donors in a common technical assistance effort to support the development of the Niger, Lake Chad and Gambia river basins. Initial studies will provide African and donor policy-makers with the data base and empirical framework for selecting the most rational and efficient planning strategy for the development of the region's river basin potential.

Institutional Development and Strategy Support

Components of the Club's strategy which may be considered as agricultural support programs includes training, agricultural research and extension, and price policy, marketing and storage. The Club's agricultural support strategy emphasizes the need to strengthen agricultural institutions and organizations, i.e., national research organizations, technical agricultural and extension services. The Club treated these programs as integral to the various components of the strategy rather than as separate items. The first generation list of projects reflects this concern with building institutions and organizational capacity to deal with major sectoral problems.

The Club's report on pricing, marketing and storage highlighted the sensitive nature of these policy issues. The report recommended, however, that before a policy could be developed aimed at increasing producer returns, intensive studies were required on alternative means to raise producers' incomes. These include:

-- increasing incomes through increasing productivity (e.g., intensifying production)

-- combining price increases with structural improvements to increase productivity (e.g., organizing cooperatives)

-- investing in roads, trails and irrigation infrastructure to reduce production and marketing costs.

The A.I.D. Response

Since the organization of the Club du Sahel in March 1976 and the submission of the Agency's first Report on the Sahel to Congress in April 1976, A.I.D. has begun to implement a range of long-term programs that fall within the agricultural strategy adopted by the Club. Examples of programs and

projects in crop intensification on existing lands, new lands, river basin development, institutional development and strategy support, which are funded from FY 1977-FY 1979 appropriations are presented below.

-- Bakel Small Irrigated Perimeters is a small pilot project started two years ago in Senegal, with A.I.D. and other donor assistance, to develop village-level irrigated perimeters using pumps to draw water from the Senegal River or from nearby swamps. The present project builds on experience gained to date and finances A.I.D. inputs for expansion into other villages. Pumps will be provided for each perimeter to draw water from the river. The combined total of these small, village-level perimeters will be over 1,000 hectares, however, individual perimeters will vary in size, most of them being in the range of 30 to 50 hectares each. A.I.D. will finance central infrastructure, farm development including pumps and dike construction, technical assistance, health surveillance and a health component. Topographic studies of the perimeters have been completed, and work is beginning on the irrigation and drainage canals and installation facilities for pumps and storage.

-- Action Riz Sorgho project in Mali is designed to increase rice and sorghum production in and around the Gao area. Activities include construction of non-submersible dikes and water gates; establishment of a regional research station to determine the mix of seed, fertilizer and practices most suitable for the region; and training of extension personnel and farmers.

A.I.D. funding will provide for full-time services of a Project Coordinator and a short-term research consultant; short-term rice production training in the United States for four extension personnel and instruction in water control management for 15 people in Mali; materials required for construction of the research station; and cost for fuel, maintenance and operational support. Major activities will center around field research, strengthening of extension delivery services, dike and water gate improvement and planning for program expansion to increase hectarage under cultivation. The sedentary farmers (about 25,000 families) who comprise 90 percent of the region's population, should realize a 40 percent gain in income resulting from projected increases in cereal population. Life of project cost per extended family is estimated at $140.

-- Lake Chad Irrigated Agriculture project is aimed at increasing food production in Chad. Phase I project activities are now underway and include crop and irrigation research, repair of

old polders, and provision of social services, A.I.D. financed the construction of housing for a research station, and purchased of vehicles. In Phase II, A.I.D. will develop a polder project using the proven design developed on the adjacent existing polders constructed by other donors. Approximately 8,000 farming families will be helped directly. These three projects are expected to increase production of basic cereals to the range of 17,000 tons annually by 1985 or enough cereal to provide the annual cereal requirements for 87,000 people.

— Operation Mils (millet) project is increasing the productivity and commercialization of cereal crops in the 5th Region of Mali. The agricultural production component of the project emphasizes applied research in millet and sorghum; training of more than a thousand pilot farmers on demonstration plots; training of extension agents; improved vegetable gardening; meeting growing farmer demand for agricultural inputs and implements; and purchase, storage and shipment of grains. The infrastructure component includes repair and maintenance of 300 kilometers of roads, well digging, training of blacksmiths, and a community development structure to improve local living conditions through functional literacy and rural health sub-projects. Cereal yields have increased. Two extension agents have received short-term training in the United States and six blacksmiths have been trained locally. Studies have been completed on farm-to-market road location and design, and a recent sociological study, including the extent of participation by women and children in cultivation and marketing, has been completed. Project cost is estimated at $125 per family.

-- Onchocerciasis Area Village Development project will improve the social and economic well-being of people resettling in the fertile White, Red and Black Volta River valleys, recently made safe from onchocerciasis (river blindness). It will be carried out by the Volta Valley Authority (AVV), an agency of the Government of Upper Volta, and will create a $1.0 million Village Development Fund to provide loans to 133 AVV villages to establish 200 income-generating enterprises. Selected villagers will be trained to manage social and economic programs. In addition, extension agents will be trained to work in the 133 villages. During the life of the project 3,320 families (approximately 19,920 people) will benefit directly from this project. Cost of project per beneficiary is $109 (based on average family of six persons).

-- Niger River Development Planning. The River Niger Commission has a mandate from its nine member states to play a coordination role in the development and exploitation of the Niger River Basin resouces and to formulate an indicative plan for the development of the land, water and human resources of the Basin. A one-year "diagnostic" study to fully elaborate project details will begin in Spring 1978. Three documentalists are undergoing third-country training and a study tour of U.S. water projects was conducted by the Bureau of Reclamation for member-state technicians. Long-term academic training in the U.S. for RNC technicians is scheduled to begin early 1978.

-- Niger Cereals Production II. Under the Phase I Niger Cereals Production project, six agricultural specialists were provided to assist the Government of Niger in establishing a solid infrastructure in extension, research, seed multiplication, credit and cooperatives. Phase I will have provided the initial infrastructure and requisite social, economic and technical experience for an expansion of the major elements to be provided under Phase II. This will involve training for over a thousand extension agents, U.S. short- and long-term specialized agricultural training, construction of research, extension, credit and cooperative facilities, an additional Seed Multiplication Center, a Foundation Seed Farm and the establishment of a National Seed Service. Other project support items include assistance to these centers by providing fertilizers, fungicides, vehicles and office support. This project is aimed at the small farmer who will receive benefits of improved technology and services. Per family beneficiary cost is calculated at $33.

-- Regional Food Crop Protection project combines the Sahel Food Crop Protection project, which strengthens plant protection services in Senegal, Chad, Mauritania, Cameroon, the Gambia, and Cape Verde, and the FY 78 Integrated Pest Management project, which supports a comprehensive research and development program for integrated pest management in the Sahel. AID-financed technicians are now in three of the countries and training materials for the local training centers are being completed. Both training centers in Dakar and Yaounde are under construction. Commodities were used by the countries to control heavy pest infestations during the recent crop year. In FY 79, technical advisors for outreach and research will be assigned, an evaluation baseline study will begin, an overall training plan will be developed, construction will start and equipment will be ordered.

Elements of the Club Strategy - Livestock

The primary objective of the Club's livestock strategy is to increase

livestock production to meet growing internal and export demands in each Sahelian country while seeking to improve per capita protein consumption in the Sahel. The secondary objectives of the strategy include recommendations:

-- to improve the availability of cattle for use in animal traction;

-- to increase the incomes and quality of life of livestock owners.

To accomplish these objectives five areas for priority attention are identified:

The evaluation of natural resources potential and range management development for which the following specific actions are recommended:

-- support for studies to improve our knowledge of the ecosystems and land use potential throughout the Sahel;

-- establishment of a systematic link between research and range management projects to evaluate the impact of these projects on both natural resources and socio-economic conditions.

Mixed Farming. The fostering of a greater association between agricultural (crop) and livestock production. To promote mixed farming, the Club strategy recommends assistance to:

-- increase the availability of draught animals and assure that required animal health services are provided to reduce the risks of parasitic and infectious diseases;

-- assist farmers to improve animal feeding, including sufficient animal water supplies near farm sites;

-- develop credit systems to facilitate the purchase of equipment, animals and feed, as required;

-- develop market outlets for mature oxen and grown-out animals;

-- accelerate the adoption of improved production methods by encouraging the creation of producer associations capable of playing a more direct role in extension; and

-- improve the productivity of on-farm production of small ruminants and other small stock.

Animal Health. The Club strategy recommends that each Sahelian government (over the next three years) undertake a preparatory phase of animal health delivery system development enabling them to:

-- assure that animal health services are provided with required supplies and equipment;

-- prepare a long-term program of disease/control/eradication;

-- reorganize the animal health services as required to improve their capability to support animal production programs.

Training and Communications. While recognizing short-term needs for trained livestock service staff, the strategy recommends a long-term orientation which includes:

-- manpower studies of future staff needs;

-- improvement of teaching materials, upgrading staff and clinical facilities;

-- continued use of scholarships for overseas training in specialized subjects;

-- improvement of links between training institutions, research stations and user services; and

-- strengthened training and communications services which permit producers to be more directly involved in planning and evaluation of development projects.

Marketing. While recognizing that most Sahelian governments favor public or parastatal livestock marketing organizations and cooperative groups of livestock-related professionals, the strategy supports:

-- facilitating a dialogue between public and private marketing interests;

-- reinforcing governmental marketing associations;

-- studies of meat export possibilities; and

-- studies of the need for commercial infrastructure such as markets, receiving stations, marketing information services and slaughterhouses.

A.I.D. Response

From modest pre-drought levels, U.S. and other donors assistance for livestock development activities has expanded to include projects in each of the Sahelian countries. Within the multidonor framework of the Club,

A.I.D. is supporting development activities that:

- help the nations of the Sahel to evolve environmentally sound, socially and economically feasible approaches to the management of soil, water, range, forest and animal resources;

- encourage participation with other donors in the design and implementation of projects that test and demonstrate socially, technically and environmentally sound development "packages" for arid and semi-arid range and grasslands;

- support the expansion of mixed farming systems in savannah zones wherever crop production occurs;

- support adaptive research to find crop rotations and management practices that will provide food for livestock and improve soil fertility with minimal use of purchased inputs;

- assist programs and projects which will open sparsely populated lands for cultivation and grazing, including predevelopment soil inventories, access roads and other infrastructure;

- assist host governments to provide adequate training in the livestock sector for lower, middle and upper-level personnel.

Examples of A.I.D. projects in the livestock sector are cited below.

- In the Chad Range and Livestock project, A.I.D. is providing technical assistance in range management at the national level. Technical assistance is also being provided to a herder training center where herders and extension agents will be trained in improved livestock production techniques. To date, 14 participants have been enrolled in U.S. universities and in audio-visual training courses; the herder training center is 80% complete and training classes have been conducted for 250 government livestock agents.

- Under the Livestock Sector project in Mali, A.I.D. is providing assistance to increase livestock production and marketing, primarily through better use of current range areas and expansion to new lands. As a result of this project, it is expected that there will be 600,000 acres of range land treated for tse-tse fly control, 600 livestock extension agents trained and 800,000 acres under improved range management.

-- The regional LCBC Livestock and Mixed Farming project is designed to develop and test resource management techniques in the Lake Chad area for cultural, political and economic acceptability to the area's population. A.I.D. support provides technical assistance, training and commodities to reduce the serious overgrazing in the Lake Chad area, to train technical extension agents and to develop marketing outlets for cattle and produce.

-- Under the Range and Livestock project in Senegal, A.I.D. will assist the Government of Senegal to develop year-round grazing on a controlled basis for approximately 16,000 animals through (a) instituting improved range management practices, (b) the strategic location of water facilities and (c) the establishment of an improved animal health program. The major beneficiaries of the project will be the small rural livestock owners who will add to their incomes through improved animal health and nutrition programs.

Fisheries

Constraints

The growth potential of marine and fresh water fisheries in the Sahel is considerable. Fish are presently an important source of protein in the Sahelian diet, and with proper development, have the potential to supply a substantially expanded percentage of the protein requirement for the region's population.

A number of constraints inhibit growth in the fishery sector. Chief among these constraints is the preservation of the catch. Approximately 30 percent of the present freshwater fish catch is lost due to improper handling and spoilage. Rapid growth in the sector will also require concerted efforts to upgrade fishery support services, improve research on fisheries biology and expand the available fishing craft and equipment. Finally, careful attention must be directed to the implications of river basin development for aquaculture, both in terms of integrating fisheries into basin development programs, as well as to minimize the disruption to fisheries from construction of dams and irrigation infrastructure.

Elements of the Club Strategy

The goal of the Club's fisheries sector strategy is to ensure the development of fishing in both the coastal and inland areas during the next 10 to 20 years. Analysis of available fish stocks indicates that considerable expansion can be accomplished within this time-frame without over fishing existing stocks.

On the basis of anticipated population trends, protein needs, and increases in individual incomes, demand for fish within the region is expected to increase from the present 370,000 tons to 700,000 tons by the year 2000. Exports of fish from the region are also expected to increase to at least 1,000,000 tons by the year 2000. Total catches must be increased from 620,000 tons per year to 1,700,000 tons representing an annual increase of 7 percent in landings. It is expected that 25 percent of these catches will come from inland waters, 40 percent from large industrial seagoing vessels and 35 percent from the small-scale coastal fishery.

Development on this scale will be possible only if substantial assistance is provided in terms of fishing techniques, fish processing techniques, marketing techniques, strengthening fishery directorates and services, improving research, and training fishery officers and staff.

This requires strengthening of all aspects of the fishing industry, which will provide the best opportunity for short-term increases in fish production. The development of skills necessary to manage and operate the fishing industry necessitates a substantial educational element. Aquaculture is viewed as having some potentital in certain areas, while training, research and small-scale fish farming activities will be initiated as a second portion of the program with longer-term payoffs.

A.I.D. Response

A.I.D. has not made a commitment to participate in the Sahel fisheries program although A.I.D. is supporting a joint project with FAO in Chad. Given the severe shortage of trained fisheries personnel in Sahelian countries, given the overall size and complexity of the fisheries program, participation by A.I.D. would require a large commitment of technical personnel and budget which are not presently available.

B. HUMAN RESOURCES

Constraints

There are three limiting conditions of particular importance to the development of human resources in the Sahel. These are: unemployment, lack of communications, and the inappropriateness of local education/training institutions.

a. Employment opportunities, whether in towns or rural areas, are meager, even for those few who are literate (10 percent of the total) or for those who have received a full primary education (less than 15 percent of the corresponding age grade).

The International Labor Organization (ILO) issued a special report in February 1977 on the employment situation in the Sahel. The report confirms that four-fifths of those employed in the Sahel, with the exception of Senegal (69 percent) and Mauritania (51 percent), are farmers or herders. Employment in the modern secondary sector (manufacturing, construction) is weak, comprising between 9 percent and 13 percent of the urban employed. By contrast, about 30 percent of urban employed find work in commerce, transport, and related services, including government service.

b. Communications. Reaching people directly will require very special efforts. The diversity of population in the Sahel, low population densities in that wide area, and the striking lack of communications facilities within the region, impede human resource development. Some 40 distinct linguistic/ethnic groups are represented among the nearly 30 million people who inhabit the eight CILSS member countries. Including city dwellers, sea fishermen, dryland and river basin populations, and nomadic herders, life styles vary sharply across the Sahel. Settlements are small and scattered. Roads are often impassable in the rains, while in the dry months waterways are closed to volume traffic.

Modern communications networks -- telephones, local radio, and the press -- are not yet sufficient for the region nor available to appreciable numbers of people. Information does not circulate rapidly or reliably. National radio and telephone systems are especially inadequate in Upper Volta, Mali, Niger, and Chad. Under these conditions, a sense of civic participation is difficult to engender.

c. Inappropriateness of the Education/Training Systems. Sahelian education/training institutions themselves are inadequate, both in size and content. The language of instruction remains French and the distribution of schools still favors the urban areas. Reform programs, which are on the books in every Sahel country, are stalled, partly for lack of funds. Primary schools enroll less than 25 percent of the primary school age population (fewer still graduate), but since schools and training establishments already absorb about 25 percent of recurrent national budgets, the CILSS countries generally cannot afford to expand the systems.

Taken together, the employment, communications, and institutional constraints of human resources development in the Sahel are manifestations of the general low level of productivity, accentuated by drought. Clearly, the development of human resources in the region will depend upon simultaneous action on all three fronts: action to promote productive employment, to develop information and communications networks, and to transform the education/training institutions which serve each of the Sahel countries.

Elements of the Club Strategy

In the short-term (1977-1982), the Human Resources Team gives top priority to the following activities:

-- the direct training of rural producers and their families in the context of production programs. This training will stress skills and information of immediate utility both to better work and living conditions. Such training will include functional literacy, nutrition, and child care.

-- the retraining of in-service extension personnel, particularly those serving at grassroots levels;

-- the strengthening of Sahelian capabilities in manpower planning, and in the design and evaluation of education/training programs. This is to prepare for the effective expansion of appropriate training systems in the succeeding phase of development (1982-1987).

In the near-term, support will be given to:

-- pilot programs to test new approaches in both formal and non-formal education. The extension of proven systems will then follow in the middle and longer term periods.

-- overseas training at higher levels to replace expatriates, particularly as trainers and managers of development programs.

For the middle term (1982-1987), as economies improve, the human resource strategy calls for a much higher level of national expenditure to enlarge upon efforts proven successful in the earlier period.

For the long-term (post 1987), regional integration of certain kinds of higher training is contemplated with that of education, training, and information systems at a national level. The types of program identified to implement this strategy include:

- basic education programs which include an extensive school construction program in Cape Verde, where the primary schools will also be designed to serve as community development centers. Other programs in this category include functional literacy programs in Mali and the national primary school reform program in Upper Volta.

- training and retraining of rural officers, a second classification, typically contains such middle level schools as the Kolo Institute, Niger's only school for agriculture extension officers.

- training and mobilization of farmers and rural artisans contains activities for preparing young farmers, herders, artisans, and new settlers by various devices including rural radio.

- community development and cooperative training for Senegal includes the much studied voluntary community program, Maisons Familiales, along with cooperative or community development training centers in most countries.

- training and upgrading of higher level personnel for rural areas is stressed. The restructuring of the regional agriculture training at Katibougou, in Mali, is one important activity in this category.

The A.I.D. Response

Of the 68 education/training projects identified by the Club du Sahel, U.S. projects either planned or underway will deal with approximately half (31), in whole or in part. By fiscal year 1979, the United States will be making a substantial contribution to human resource activities in each of the eight CILSS member countries.

U.S. concern with the human resource sector in the Sahel is recent: a product of post-drought planning since 1974. A.I.D. projects in the Sahel, as elsewhere, have almost invariably included significant elements of participant training. In FY 1977 however, A.I.D. initiated several

projects which are entirely devoted to training, some funded under the Food and Nutrition category, others directly from the Education and Human Resources section. At the present time, U.S.-funded human resource development projects in the Sahel may be grouped under three categories.

a. Direct Rural Outreach

A.I.D. is currently implementing a variety of direct approaches to farm families. These include:

-- a non-formal, family oriented training program, Promotion Humaine, in Senegal. This is being coordinated with both the U.S.-funded cereals production project in the Groundnut Basin and with the livestock project at Bakel, in Eastern Senegal. Beginning in FY 1978, the early effects of this non-formal program will be evaluated. With modest support, Promotion Humaine is active in diverse ways, including the training of artisans to repair simple farm equipment, training for council and cooperative representatives, and local instruction in home gardens and child health practices. A.I.D. also plans to support Promotion Humaine activities in conjunction with a production program in the Casamance Region.

-- The Primary and Non-Formal Education project in Cape Verde will establish a work-oriented community development program through primary school centers in 150 communities throughout the islands.

-- The Mali Rural Works program seeks to involve villagers directly in the planning and execution of small scale self-help projects.

-- The Women's Role in Development project in Upper Volta provides U.S. support for local training. Low interest loan funds will encourage women in 60 villages to organize, manage, invest in, and carry out a range of productive activities.

b. Training Agriculture Agents

Extension agents at the ground level still represent the principal means of reaching small farmers and herders with improved techniques and services. Throughout the Sahel, U.S. support will focus on ways to improve the training offered by the high school-level agriculture schools. For example:

- in Mali, the Agricultural Officers Training project, through building two agricultural apprenticeship centers, will improve the country's output of junior level agricultural technicians.

- in Senegal, the SAED Training project, will assist SAED (the country's extension agency in the Senegal River Basin) to develop a training program for upgrading the skills of its personnel.

- in Upper Volta, through the Agriculture and Human Resources Development project, U.S. funds will create and expand facilities at two secondary schools for agriculture training, as well as assisting the university-level institution for preparing agricultural trainers and other middle-level support personnel.

c. Comprehensive Planning and Development

In addition to the above two categories of projects, A.I.D. also seeks to support a more comprehensive approach, which combines manpower planning and other elements, such as:

- in Chad, the Comprehensive Human Resource project is a model for this approach and presents a support package: (1) for adult education delivered through the primary school system, (2) for a system of manpower planning, and (3) for in-service management training of civil service personnel.

- in Niger, the Rural Sector Human Resources Development project will begin to meet the need for trained people at the middle and farmer levels. The project will support a coordinated approach through improved training for extension workers, cooperatives, literacy, project management and manpower planning.

- a regional program, Strengthening Sahelian Institutional Capability, seeks to improve the absorptive capacity in the Sahel through professional upgrading of personnel in key training institutions and other agencies responsible for rural development.

C. HEALTH/WATER/NUTRITION/POPULATION

Constraints

The poor health and nutritional status of the people of the Sahel are significant determinant of its limited capacity to engage fully in activities designed to achieve overall development of the region. Over the past several decades, the health profile of the Sahelian population has changed very little: infant mortality is higher than in any other area of the world (160 to 200 per 1,000 live births) and life expectancy at birth averages under 40 for the region. Less than 15 percent of the population are estimated to have access to potable water. Although accurate data are generally unavailable, it is known that bacterial and viral infections, in combination with poor nutrition, are the major causes of morbidity and mortality. There are high rates of malaria, measles, meningitis, and other communicable diseases, tuberculosis and other broncho-pulmonary ailments; onchocerciasis; trypanosomiasis; schistosomiasis. Protein-calorie malnutrition contributes to the severity of these diseases, especially among young children. In turn, malnutrition is made more severe due to lowered efficiency in the use of nutrients by a population already weakened by infections.

Although research is still needed in the area of population dynamics in the Sahel, there is, and undoubtedly will continue to be, disagreement among Sahelians and even other donors as to whether or not there is danger of over-population in the near future, while survival rates are still low. Demographic trends in the Sahel are characterized by high fertility rates and by high death rates, particularly among infants. As death rates decline slowly, the result of improved health status, the population growth rate will begin to spiral. Larger numbers of dependent children will survive and need to be supported. Currently, women have virtually no access to family planning information or services in the Sahelian countries; a combination of indigenous traditions and government policy continues to reinforce this situation.

Given the lack of significant change in the patterns of disease, it is apparent that the health services and infrastructure in the region have been ineffective in addressing the major health and nutrition problems of the people of the Sahel in the context of limited resources. Development has been concentrated on high-cost, urban and hospital-based health services which serve only a small segment of the population. Basic preventive and curative health services to the rural majority - 85 percent of the population in most cases are minimal or nonexistent except for traditional medical practices whose value has been little understood or recognized. Along with the development of high-cost services has been a strong emphasis on expensive education of high-level health professionals.

Elements of the Club Strategy

In late 1976, the development of a long-term strategy for addressing the problems of health, water and nutrition described above was undertaken by the Human Resources Team of the Club du Sahel Working Group. A conceptual framework rather than a detailed planning document, the strategy is designed to link interventions in health to overall socio-economic development in the Sahel. The goal is "to improve the health status of the population, particularly the health of mothers and children...and the active and productive members of the population" by making basic health services available throughout rural areas of the region.

Emphasis in the strategy is placed on the development of village-based health services involving the active participation of the communities themselves and the recognition and utilization of traditional institutions and socio-cultural patterns. Components of the village-based system include endemic disease control, nutrition, environmental sanitation, provision of adequate water, and demographic and family planning.

The strategy calls for the use of village health workers who are trained to provide health promotive, disease preventive and simple curative functions.

A.I.D. Response

Until recently A.I.D.'s efforts in the health sector have been primarily short-term and related to relief and rehabilitation in immediate response to the drought. However, the present situation reflects significant progress in supporting long-term rural health programs within the framework of the Club's strategy.

In addition to support for policy and planning initiatives at the CILSS Secretariat, A.I.D. is presently undertaking important projects in health/water/nutrition primarily on a bilateral basis. These projects are grouped into five general categories: village-based health systems, endemic disease surveillance and control, demography and family planning (including data collection and analysis), environmental sanitation/water and nutrition. Examples of these projects are cited below.

-- Under the Rural Health Services Development project in Senegal, A.I.D. assistance will be directed to extending health services to the rural poor in the Sine-Saloum Region. The three-year project provides for the training of 1,800 village health workers, the construction of 600 village health units and training of corollary support personnel. The project will benefit the 600,000 people scattered over an area of 23,495 square kilometers.

— In Niger, the Improving Rural Health project will expand the viable rural health delivery system which provides prevention, early diagnosis, curative interventions and appropriate referral services. It is expected new and retrained health teams will provide approximately 40 percent of the population with basic health services.

— The Health Surveillance project in Senegal will establish a capacity to monitor the incidence of water-borne and related diseases which may occur as a result of irrigation schemes and other river basin development activities. In 1977, a Yale University team conducted studies to determine the incidence of transmissible diseases and establish a data base against which changing health patterns may be measured.

— The regional Demographic Data Collection and Analysis project will assist in establishing a regional network capable of coordinating the collection, analysis and practical application of a demographic data unit housed in the Sahel Institute. It will also assist individual countries in the practical collection, analysis and use of population data. Such data will reinforce the importance of sound demographic policies in the design, implementation and evaluation phases of ongoing and planned projects.

— Under the Chad Rural Sanitary Water project, A.I.D. will assist the Government of Chad to provide potable water to rural populations through the installation of 800 closed wells. It is anticipated that the direct beneficiaries of this project will be approximately 400,000 individuals. The improved water available will contribute significantly to reducing water-related diseases.

In addition to providing support to the hea' tor through the above mentioned SDP projects, A.I.D. is also inv.. ' in a number of other related activities in the areas of family planning, nutrition and overall regional health planning.

Family Planning

Title X funds are supporting a family planning demonstration activity, being added to a five-year rural health development program in Mali, beginning in FY 1979, and a similar family planning project is beginning in Senegal. In addition, the Institute for Development and Economic Planning in Dakar plans to evaluate the relationship between population trends and staple food production in the Sahel. It is expected that the above described demographic project will lead to further family planning initiatives in the region.

Nutrition

The case for nutritional surveillance, analysis and intervention strategies cannot be over stated. Food is the single most important variable in the Sahel and probably the basic limiting factor for development of the region.

A.I.D. nutrition strategy, which was developed in FY 1977, focuses on nutrition policy and planning on a regional scale and is supplemented by a compilation of over 3,000 references on Sahelian nutrition and food systems. This strategy gave rise to a FY 1978 activity involving a multi-sectoral workshop on nutrition planning and surveillance. This workshop was an important step toward comprehensive nutritional planning and the ultimate relief of nutritional deficiency syndromes. In addition to the workshop, an ongoing nutritional survey is being sponsored in Mali. This activity deals with site-specific intake data and dietary analysis. These data will increase the understanding of caloric and protein requirements and food intake on an age and sex-specific basis. These data will be valuable in planning and implementing national and region-wide nutritional strategies.

Finally, A.I.D. is developing a nutrition research project in Upper Volta designed to develop and diffuse weaning food recipes for use by women in rural areas.

Overall Regional Health Planning

At the request of CILSS, A.I.D. supports a Public Health Advisor to coordinate health sector activities at the CILSS Secretariat. In addition, A.I.D. will assist in the preparation of a CILSS inventory of first generation projects in health/water/nutrition in mid-1978. Project portfolios will be prepared for review by A.I.D. and other donors. Following a final review of the portfolios by the Directors of Public Health Services of the eight CILSS countries, A.I.D. will participate in a donors meeting to determine directions for future investments in the sector. It is anticipated that regional and national projects will be identified for implementation on a multilateral as well as bilateral basis.

D. ECOLOGY AND REFORESTATION

Constraints

Evidence strongly suggests that the main cause of the recent disaster in the Sahel was not the drought itself. Drought is an historical climatic phenomenon that has frequently occurred in the Sahel. It is believed that the impact of the 1968-1975 drought was significantly aggravated by increased human and animal populations and the breakdown of ecologically sound, traditional agricultural and livestock production systems.

Until recently, the traditional land use system of peasant societies and the migratory patterns of nomads offered a striking illustration of man's ability to support himself in a region characterized by variable rainfall and scarce resources. In the past, sedentary farmers established a system of land use which maintained soil fertility.

These traditional land use systems have broken down over the past half century due to the introduction of cash crops and the increase in the rate of population growth. This has created an increased demand for cultivated land which has been partially met by planting food crops on marginal land and by reducing fallow periods to five years or less. The consequence has been a decline in soil fertility and increased susceptibility of the land to wind and water erosion.

Population pressure has resulted in forests and woodlands being cleared for cultivation and cut to meet growing demands for charcoal, firewood and construction material. Where tree roots are no longer present to strengthen the soil, conditions of water and soil erosion prevail. As a result of declining soil stabilization, reservoirs, canals, streets and settlements are being covered by dust, sand and dirt.

The decline of forests and woodlands has created a critical shortage of firewood - the major source of energy in the Sahel's rural households.

Overgrazing, caused by the increased herd population has also caused soil erosion and an overall reduction in the vegetative productivity of Sahelian pasture. The lack of sufficient planning in the sinking of boreholes has also contributed to the decline. These all year watering points have attracted far more animals than the surrounding pastures can support.

Sahelian capabilities to halt environmental degradation and to protect and improve the natural resources are limited. Expertise in forestry, range and agricultural management is scarce, both at the policy level and in the extension services. Existing training institutions are not producing the required numbers of qualified technicians to meet current demands.

Elements of the Club Strategy

The Club du Sahel ecology strategy addresses the:

-- scarcity of wood for fuel

-- indiscriminate cutting of wood and woody vegetation to satisfy fuel requirements

-- lack of fully operational range management systems.

The long-term goal seeks to achieve food self-sufficiency through the sustained and balanced management of the Sahel's natural resources. More specifically, the strategy is designed to: (1) satisfy needs for cooking fuel and construction material; (2) stabilize pasture output; (3) arrest soil deterioration; and (4) conserve the region's flora and fauna.

A.I.D. Reponse

A.I.D. activities in support of the Club strategy include projects in Senegal, Mauritania, Cape Verde, Niger and the Gambia. The purposes of AID-supported activities in the area of reforestation/conservation of natural resource are threefold:

-- to strengthen national and regional planning and management capabilities to implement ecologically sound programs;

-- to train personnel at all levels to design and implement these programs; and

-- to provide ecological stabilization through activities such as reforestation and revegetation.

Examples of A.I.D. projects in the ecology sector include:

-- the Renewable Resources Management project in Mauritania, in which A.I.D. will assist the government to assess its land, soils, forest, vegetation and water resources. The project will test for sand dune stabilization, natural revegetation, and forest and range management. The purpose of these pilot schemes is to test the technical, economic, political and social feasibility of such interventions. This approach is of particular importance in Mauritania, where little is known about the fragile desert ecology. With the exception of an international private voluntary organization, to date the U.S. is the only donor committing resources in Mauritania to this priority program. The U.S. project also provides for

a resource inventory, which will be the basis for developing a national resource management plan, and on-site training for forestry personnel.

-- the Land Conservation and Revegetation project in Senegal will assist the government in planning for natural resource management to address Senegal's four prime environmental problems: (1) decreasing soil degradation at deep bore well points in rangeland areas; (2) preserving existing forests and wood resources against uncontrolled wood cutting and fires; (3) preventing further deterioration of soils and reductions of crop yields in the country's peanut and millet producing regions and (4) conserving forests resources in the Cap Vert (Thies - Dakar) Region.

-- the Reforestation project in the Gambia in which A.I.D. will provide technical assistance to the government to strengthen its planning and management capability. This entails the establishment of a Soil and Water Unit within the Ministry of Agriculture and Natural Resources. The project also provides for training government employees and extension agents in Africa and in the U.S.

-- the Management/Soil Conservation project in Cape Verde in which A.I.D. will provide technical assistance to strengthen institutional planning capacity for the conservation and rehabilitation of the country's natural resources. This will be achieved by: establishing a Resource Planning Unit within the National Forest Service; conducting a basic resource inventory; developing a comprehensive, long-term rehabilitation and conservation plan; training government personnel, and extension agents.

E. INFRASTRUCTURE

Constraints

The lack of adequate rural infrastructure is a prime constraint to Sahelian development. Where infrastructure exists, much of it is rudimentary and in poor condition due to inadequate maintenance. For example, of the secondary and feeder roads which make up 72 percent of the 80,000 kilometer road network in the Sahel, 93 percent of them are in poor condition (see footnote under Table 1). This poor condition of the road network was and is a major impediment to the transportation of drought relief supplies and contributes to the relative isolation of rural areas. This isolation is a serious constraint to rural development and agricultural marketing.

The sparseness of major rural infrastructure is further indicated by the fact that there are few irrigation schemes in the Sahel, despite the existence of over 3,000 km of major rivers flowing through the region. Many of the existing schemes are in a state of disrepair.

Infrastructure supporting health and education services is also inadequate, particularly in rural areas, as indicated by the statistics in Table 2. Since independence in the early 60's, progress in this area has been significant, but the Sahel still lags behind other African countries. Construction of infrastructure presently represents only 3 percent of GDP compared with 8 to 12 percent in more active developing countries.

There are several critical factors influencing the rate of infrastructure development in the Sahel. These include a shortage of engineers, planners and skilled workers in a number of Sahelian countries and a shortage of middle level management personnel for public works in all Sahelian countries. Also there are inadequate budget funds.

Elements of the Club Strategy

Lack of adequate infrastructure was recognized as a general Sahelian problem from the beginning of the Club, which designated transport and feeder roads as its top infrastructure priorities. Many of the projects that were proposed by the CILSS immediately following the drought were infrastructure projects. Both the history of the drought and the subsequent relief efforts highlighted the lack of agricultural infrastructure and the inadequacy of transport links.

Transportation and Feeder Roads

The Club du Sahel has adopted a three-step strategy in identifying transportation projects. The first step is to focus on the maintenance of the road system in the Sahel. This responds to the problem of currently

Table 1

SECONDARY AND FEEDER ROAD NETWORK
IN THE SAHEL IN 1977 (KMS)

(1) Country	(2) Secondary	(3) Feeder	(4) Total - Secondary & Feeder	(5) Total Network	(6) % of Roads in Poor[1] Condition
Cap Vert (% Tot. Net.)	162 (21.4)	283 (37.3)	445 (58.7)	758	n/a
Niger (% Tot. Net.)	977[1] (5.3)	13,655 (74.3)	14,632 (79.6)	18,377	58[a] 96[b]
Mali (% Tot. Net.)	5,595 (39.6)	2,818 (20.1)	8,413 (59.9)	14,045	n/a
Gambia (% Tot. Net.)	130 (4.4)	1,954 (66.0)	2,084 (70.4)	2,960	67[a] 91[b]
Upper Volta (% Tot. Net.)	398[2] (2.4)	14,400 (87.5)	14,798 (89.9)	16,462	65[a] 87[b]
Mauritania (% Tot. Net.)	1,730[3] (24.4)	655[4] (9.2)	2,385 (33.6)	7,090	75[a] 97[b]
Senegal (% Tot. Net.)	6,140[5] (46.3)	3,530 (26.6)	9,670 (72.9)	13,250	n/a
Chad (% Tot. Net.)	991[6] (13.6)	4,575 (63.0)	5,566 (76.6)	7,269	n/a
Total (Region) (% of Tot. Net. in Region)	16,123 (20.1)	41,870 (52.2)	57,993 (72.3)	80,211	66[a] 93[b]

1 More than 50% of the road surface is defective, e.g., large ruts and potholes, washouts, etc.
2 33% of ordinary and improved earth roads.
3 Regional Roads.
4 Total Network - (regional & national roads)
5 Regional and Departmental Roads.
6 5% of non-primary ordinary track plus laterite road and track.

SOURCE: Louis Berger International and INGECOT, Road Maintenance and Diagnostic Study for the Sahel - Draft Final Report, July 1977, Vols. 2-9.

[a] Classified Network only

[b] Including unclassified network

Indicators of Infrastructure Development — Table 2

Country	Road Network (Total km per 10,000 sq km)	Health (Number of hospitals & clinics/1000 pop)[1]	Education (Number of primary schools/1000 pop)[2]
Cape Verde	.19	.05	1.4
Chad	.006	.01	.21
The Gambia	.29	.01	.20
Mali	.01	.01	.21
Mauritania	.007	.004	n/a
Niger	.02	n/a	.22
Senegal	.07	.01	.30
Upper Volta	.06	.03	.12
Sahel Average	.08	.02	.38
Ivory Coast*	.11	.04	.45
Ghana*	.14	.02	1.07

Sources: [1] Hospitals from United Nations Statistical Yearbook, 1976, Table 206.

[2] Primary Schools from UNESCO Statistical Yearbook, 1975, pp. 122-151.

Road Network from Louis Berger International, Road Maintenance Diagnostic Study for the Sahel, 1977 Volumes 2 and 9.

poor road conditions and provides a capability to maintain any future road projects that would be a part of Club-integrated development projects. The first projects of this kind are a series of road rehabilitation projects financed by the United Nations Sahelian Office (UNSO) in each Sahelian country. An additional multidonor road maintenance and rehabilitation project has been organized by the Club (including A.I.D.) in Chad, as a forerunner to similar comprehensive road maintenance programs in other Sahelian countries.

The second generation of transportation projects will be secondary and feeder road construction in those integrated rural development areas which are associated with development activities in the agriculture, livestock or fisheries sectors. At the same time, planning in the transport sector will proceed with a focus on major roads, river transport and railroad projects, which may be required to support large scale development programs in the Sahel, such as river basin development programs. These second generation projects are presently being identified by the Transport Working Group of the Club.

Other elements of the Club's strategy include infrastructure activities for:

-- agriculture and river basin development;

-- health and education; and

-- ecology.

Agriculture and River Basin Development

The agriculture strategy focuses on raising the productivity of present farming areas for the short term. This requires a relatively small infrastructure component for the first generation projects. During this period, emphasis is placed on the rehabilitation and/or intensification of existing irrigation schemes and techniques to improve traditional forms of irrigated agriculture.

Studies of the infrastructure needs for future projects, particularly for irrigation projects, are proceeding and are expected to produce a major demand for infrastructure funding by the Club in second generation projects. Planning is also underway to harness the water resource potential of the Niger, Senegal, Logone and Chari rivers and the waters of Lake Chad. This planning is being executed through regional river basin commissions

supported by UNDP-organized, multi-donor consortia. Given the early stage of planning, it is not possible to identify specific mainstream regulatory structures (dams) that may be recommended for construction. It is certain, however, that over the course of the next ten years, construction of one or more mainstream regulatory structures will be necessary to tap the agriculture, power and transport potentital of these rivers. At present, the Club is analyzing, through the various multi-donor consortia, all feasible alternative watershed development strategies.

Health and Education Infrastructure

Infrastructure in these fields is a significant component of project expenditures, averaging approximately 25 percent of donor funds. Therefore, the active Club role in health and education implies a significant level of infrastructure to support increased services.

The education and training needs in the first generation of Club projects are centered on the training of rural extension workers, basic education and community development. Elaborate infrastructure is not necessary for these types of training although some buildings are required. This will result in a lower-than-average proportion of infrastructure initially. Later generation projects will require a higher proportion of infrastructure, but not as much as urban-based education infrastructure.

The rural orientation of the health sector strategy also implies a relatively low infrastructure component for health service delivery itself. Infrastructure for health-related projects in water supply is another type of project which will raise the overall health sector investment in infrastructure close to the 25 percent level cited above.

Infrastructure for Ecology Programs

Infrastructure needs for ecology programs have been identified as equipment and physical structure for planning and management activities as well as construction of dams and other water resource management facilities designed to assist in land reclamation for environmental management efforts. The development of remote sensing capabilities also implies a sizeable investment in buildings and data processing equipment. Other programs in environmental management focus on planning and technical assistance, which carry low infrastructure components.

In summary, the Club strategy for infrastructure is directed to transport infrastructure. However, implicit in other sector strategies are requirements for infrastructure that are just as significant, and in irrigated agriculture, probably greater than for transportation in the long term.

The A.I.D. Response

Projects identified and implemented by A.I.D. since 1976 have focused on minor rural infrastructure such as feeder roads and village water supplies. Additional minor infrastructure has been incorporated as components of integrated projects in agricultural production, training and health.

Present and proposed (FY 1979) A.I.D. funding for minor infrastructure are summarized in Table 3. Total funds forecasted for "direct" infrastructure projects, e.g., feeder roads, village water supplies, will amount to $25.0 million over the period 1976-1979. A further 14 percent of obligations ($35.4 million) was allocated for "complementary" infrastructure - that is infrastructure that is part of integrated projects in other sectors. The complementary infrastructure component of FY 1979 projects has increased to 24 percent, although the percentage of total obligations to infrastructure projects has remained near 10 percent.

Table 3
Total A.I.D. Proposed and Present
Obligations for Minor Infrastructure
(millions of $)

	FY 1976-1979		FY 1979 Only	
	Total Obligs.	Infra-structure	Total Obligs.	Infra-structure
1. Direct, Minor Infrastructure Projects	25.0	25.0	9.5	9,5
2. Components of Other Sectors				
-- Agriculture	96.6	12.8	31.4	7.6
-- Livestock	25.0	2.7	10.8	2.0
-- Fisheries	1.0	0.0	0.7	0.0
-- Human Resources	32.5	8.7	13.4	3.7
-- Health	30.5	3.7	14.5	1.4
-- Ecology	35.9	8.1	13.8	5.9
3. Total All Sectors	236.5	60.4	94.1	30.1

Direct Infrastructure Projects

The Regional Rural Roads project has closely followed the Club strategy with an emphasis on feeder road rehabilitation and maintenance. The FY 1978 project for regional rural roads provides for A.I.D. participation in a multidonor comprehensive road maintenance and rehabilitation project in Chad. Eastern ORD rural roads has also provided for road rehabilitation in Upper Volta. The FY 1979 roads project will expand this activity along with feeder road construction to several other Sahelian countries.

Complementary Infrastructure Projects

Infrastructure for agriculture has mainly consisted of providing market and storage structures in several Sahelian countries including Senegal, Mali and Niger.

AID-financed construction of training centers for educational programs and human resource development have provided the principal infrastructure support to these programs. For example, training centers for agricultural extension officers in Senegal, Mali, Niger and Upper Volta have been or will be constructed with A.I.D. funds through FY 1979. A.I.D. is also contributing infrastructure in the form of millet mills and water pumps for projects directed toward women in development.

In the area of health, A.I.D. has sought to strengthen the delivery mechanisms of health services by refurbishing existing and constructing new dispensaries, clinics, and health stations at the village level in Niger and Senegal. The lack of potable water supplies, a major concern in the Sahel, has led to the development of two Sahel Development Program projects to provide year-round rural sources of water.

Infrastructure components in the ecology sector include significant investment costs associated with providing infrastructure capabilities for the remote sensing and water data network programs. These facilities include receiving, data processing water surveillance, and automatic picture-taking (ATP) stations.

Land reclamation programs require the construction of water resource management structures. In Mauritania, small dams are being built and maintained, as well as water retention structures which are designed to recharge two aquifers, one each at the Oases of Atar and Tidjikja. In Senegal, a major land reclamation effort involves the construction of firebreaks, fencing, and water distribution systems.

In summary, A.I.D.'s present plans for infrastructure in the Sahel focus largely on minor infrastructure to provide village-level improvements, which will complement larger-scale development projects now being planned by the Club du Sahel.

Future A.I.D. Infrastructure Projects

While present and proposed FY 1979 A.I.D. spending on infrastructure in the Sahel has been limited to minor rural infrastructure, A.I.D. has participated with other donors in the planning, of major infrastructure projects. These projects, which will be financed through multidonor consortia, include major road links to isolated regions of the Sahel; the rehabilitation and construction of irrigation structures and the construction of selected mainstream regulatory dams after completion of comprehensive

basin development plans and associated feasibility and environmental studies. At present, U.S. technical assistance is being provided to the various multi-donor consortia to ensure that feasible alternative development strategies are explored prior to recommending construction of any specific regulatory structure. The assistance provided by the U.S. has been utilized for environmental studies, river basin, mapping, management and institutional support.

Due to the large amount of funds involved, A.I.D. has had particular interest in ensuring that project design is as closely tied as possible to smaller farmers, and that potentially negative environmental effects are minimized. A.I.D. investments in these major infrastructure projects are under consideration for FY 1980 funding. As stated earlier in this Report, A.I.D. is not proposing FY 1979 financing for any major infrastructure activities. This Fall, A.I.D. intends to present to Congress a more detailed statement both in an overall rational strategy for infrastructure development in the Sahel, and recommendations concerning A.I.D.'s participation in such infrastructure development.

Annex A: Background Paper on the Club du Sahel

The catastrophic effects of the 1968-1974 drought on the peoples and economies of the Sahel dramatically illustrated the fundamental problems of the region. To determine whether these problems could be solved, and if so how, the various development assistance organizations commissioned a series of studies. These studies[1], all concluded that the means were available to overcome the primary problems and that the Sahel could achieve food self-sufficiency and sustained economic growth within the next 15 to 25 years.

The studies agreed that the piecemeal, short-term and uncoordinated development efforts of the past would not achieve food self-sufficiency and sustained socio-economic growth. Rather, it was necessary to undertake coordinated, comprehensive, long-term regionally integrated planning, the primary constraints to development.

Coordinating Sahelian (Mali, Chad, Upper Volta, Mauritania, Niger, Senegal, Cape Verde and the Gambia) activity toward regional long-term development became the primary role of the Permanent Interstate Committee for Drought Control in the Sahel (CILSS). The CILSS was evolving from an initial role of donor resources solicitation for drought relief toward leadership in region-wide integrated planning. France, the United States and other principal donors began to work with the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) to develop a forum for international consideration of long-range development objectives.

The concept of an international Club for the Sahel won general acceptance among Sahelian states and donor organizations. As a result, the first meeting of the Club du Sahel occurred in March 1976 in Dakar, Senegal, under the aegis of the Presidents of Senegal and Mauritania. At this meeting it was:

-- Concluded that the Club du Sahel should not become another international development organization, but rather, should serve as the forum to coordinate and design an international development program for the Sahel;

---

[1] Framework for Evaluating Long-Term Strategies for the Development of the Sahel-Sudano Region. Massachusetts Institute of Technology; An Approach to Recovery and Rehabilitation of the Sahel Region. United Nations Sahel Office; World Bank Approach to Economic Development of Sahel - IBRD; Perspective Study of Agricultural Development in Countries of the Sahel Area. FAO; and Progress Report on the Drought-Stricken Regions of Africa and Adjacent Areas. UNDP.

-- Recognized that a "critical mass" investment and program approach has crucial advantages over an incremental approach. It was recognized that more substantial international investment could lead to food self-sufficiency in the region;

-- Agreed that integrated regional planning is required to: identify and design high return programs, define the necessary temporal and functional relationships among projects, coordinate bilateral and host-country funded projects with major regional programs, and provide in-process evaluation;

-- Acknowledged that the program must be placed under the complete management control of the recipient nations as soon as possible.

To initiate the planning process necessary for Sahelian development, the Club du Sahel established an International Working Group. Within this Working Group, four production teams were charged with developing strategies for rainfed and irrigated agriculture, livestock and fisheries and five horizontal teams responsible for addressing the key structural, human and technological considerations. The tenth, a synthesis group, was responsible for maintaining substantive integration among the other teams and team schedules. The teams completed detailed analyses of each sector and from the analyses derived medium and short-term goals for each sector and identified specific projects necessary to attain these goals.

The work of each of the sector teams was then harmonized and put in the context of an overall strategy by the Snythesis Group. This overall strategy is contained in the Club du Sahel's "Strategy and Program for Drought Control and Development in the Sahel."

The primary long-term goals identified in this strategy are food self-sufficiency and sustained socio-economic growth. The goal of food self-sufficiency is not meant to be absolute autonomy in food production at a national level. Rather the goal is defined as regional food self-sufficiency in staple foods.

The strategy also recognizes that food self-sufficiency cannot be the sole objective of a long-term program. As a result the goal of sustained socio-economic growth is given equal priority.

To attain these goals a two phase strategy was designed.

-- Phase I priorities are directed to improving the capacity and productivity of existing resources (e.g., manpower and agricultural lands), planning for the development of the region's major river basins and other water resources and improving the health, educational and nutritional status of the population.

-- Phase II is aimed at achieving self-sufficiency in staple food crops and sustained economic growth. During this phase, prime attention will be focused on implementing phased river basin development, completion of major transportation links and expanding the capacity of the region to export agricultural products, livestock and raw materials.

While the strategy represents a substantial first step to integrated long-term planning, it is clearly stated in the document that ". . . under no circumstances should the proposed program be considered final. It is indicative, especially since it relates to a distant time frame and it should be reviewed periodically."

The preparation of the various sector plans and the "Strategy and Program for Drought Control and Development in the Sahel" was keyed to the second meeting of the Club du Sahel held in Ottawa in the Spring of 1977. The meeting was attended by representatives of all the Sahelian states. Bilateral participants included the United Kingdom, the Netherlands, Austria, Saudi Arabia, the United States, Canada and Italy. International organizations participating included all of the principal UN organizations, including the World Bank, the FED (European Development Fund), and a large number of African regional organizations.

The formal Club meeting, which began on May 30, followed three and a half days of technical meetings. The purpose of these technical meetings was to review the results of the Working Teams and from this review make recommendations to the Club du Sahel.

The major accomplishments stemming from the second meeting of the Club du Sahel include:

-- Donor pledges of close to $1 billion in annual assistance to the Sahel along with messages of support for the Club from President Giscard d'Estaing of France, Prime Minister Trudeau of Canada, World Bank President McNamara and from President Carter;

-- Unanimous approval of the development strategy outlined in the "Strategy and Program for Drought Control and Development in the Sahel" and the first generation program (1972-1982);

-- Establishment of special commissions to analyze the problems of local and recurrent costs, pricing and storage policies, and energy;

-- Agreement to shift the locus of planning to the African CILSS headquarters in Ouagadougou.

Having adopted the common development strategy evolved by the Working Group Teams during 1976-1977 at the Ottawa meeting, the Club du Sahel reaffirmed that "the Sahelian states must be the architects of their own development and that their institutions must become fully responsible for development operations." In order to increase Sahelian capability for conceptualization, design and implementation of projects, the Club stressed the need for greater support to African national and regional institutions. Emphasis was also placed upon the importance of achieving coherence between the overall strategy, CILSS/Club programming and the national planning processes of Sahelian states.

The Club requested both the CILSS and its own Secretariat to further refine the development strategy and to work more closely with Sahelian member states to develop priorities while proceeding with the implementation of the first generation program. CILSS was mandated to continue the Working Group Teams under its aegis and promptly reorganized and expanded its Secretariat to accommodate the increased workload.

Accountable to its Chiefs of State who periodically meet to review items of policy or to resolve special problems, and to the CILSS Council of Ministers (at least one minister from each member state) which meets at least twice a year to examine and approve CILSS program of work (plans and progress), budget status (current and projected) and audit report, the Chief Executive Officer of CILSS is the President of the Council of Ministers and is ex officio designated as the Minister Coordinator.

At the December 1977 meeting of the CILSS Chiefs of States and Council of Ministers in the Gambia, the Presidency of CILSS passed from Mauritania to the President of the Gambia, Sir Dawda Jawara, and the Senegal Minister of Rural Development, Adrien Senghor, assumed the duties as Minister-Coordinator from Minister Boulama Manga of Niger.

The Executive Secretary at the CILSS Secretariat in Ouagadougou (Ali Cisse, Mali), under authority from the Minister Coordinator, is supported by three divisions: administrative, documentation and projects and programs, each of which is headed by a Sahelian. The latter Division of Projects and Programs is comprised of technical advisers (provided by both donors and member states), and is the unit responsible for continuing the strategy and program activities of the Working Group Teams. The Working Group now consists of six sectoral teams:

-- Crop Production (including rainfed and irrigated agriculture, plus a regional management unit for the Crop Protection program)

-- Livestock

-- Fisheries

-- Ecology and Forestry

-- Human Resources (including health planning, manpower needs and education)

-- Transportation

Each team includes two Sahelian leaders who have been appointed by their national governments, at least one rapporteur resident in the CILSS Secretariat (usually an expatriate technical specialist), and a co-rapporteur assigned from the donor community. These core teams work under the supervision of the Sahelian Director of Programs and Projects and convene on an ad hoc basis, often supplemented by other specialists provided from Sahelian member states and from the donor community.

An Economics and Statistics Unit and a Synthesis Group comprised of the core members from the six teams meet regularly to facilitate intersectorial linkages, to improve the consistency of the first generation projects and to more effectively integrate programs for the second and third generation. At its most recent meeting, in November 1977 in Ouagadougou, the Synthesis Group created three ad hoc task forces concerned with:

-- Mixed agriculture-livestock farming systems;

-- New land settlement activities; and

-- Sylvo-pastoral programs.

The Synthesis Group has also created two auxiliary groups to:

-- Prepare a project for reinforcement of national statistical services in member countries, designed to establish a data base to facilitate planning, monitoring and program evaluation in each state;

-- Test out the multi-criteria project appraisal methodology on selected first generation projects.

The plan of work proposed by the Synthesis Group was submitted and approved at the Council of Ministers meeting in the Gambia in December 1977.

Moreover, the Council of Ministers reviewed and endorsed the CILSS/Club plan to integrate its own planning process with that of its member states by reestablishing the CILSS National Committees. Originally created at the first meeting of the Club at Dakar in April 1976, revitalizing these Committees would:

-- Provide an instrumentality for strengthening the planning processes and capability of its countries.

-- Facilitate dissemination of information concerning CILSS/Club activities.

- Enable a systematic exchange of information requisite to successful integration of CILSS/Club planning with national priorities and plans.

- Promote provision of technical assistance for project preparation at both national and regional levels.

- Identify areas requiring studies or further work for potential inclusion in second and third generation programs.

Three countries (Mali, Niger and Upper Volta) have already reinstituted their Committees. Senegal is in process, and Chad, Cape Verde and the Gambia are expected to get underway by the time of the visits to each member country by a CILSS/Club delegation in early 1978 at which time the Chief of State will activate the Committee by formal decree.

Consonant with CILSS/Club concern for the need to coordinate dissemination of research findings, a specialized unit of the CILSS, the Institute of the Sahel, was authorized by the Council of Ministers in December 1976. Now formally approved by the Chiefs of State and Council of Ministers at their December 1977 meeting, the Institute is located at Bamako, Mali under the leadership of Oumar Ba as Director and Minister Sori Coulibaly (Mali) as Chief of the Institute's Governing Council which will include the Directors of National Research Institutions. Included in the Institute's mandate is:

- Coordination and harmonization of research;

- Training of researchers and specialized technicians;

- Maintenance of a comprehensive documentation center;

- Dissemination of research results;

- Support to strengthen research capability of national research institutions; and

- Maintenance of a demographic research unit to coordinate regional research programs (e.g. migration and settlement studies), promote national demographic activities, and to systematize demographic research priorities.

Of particular interest to the United States, provision is being made to finance the planning for the demographic unit of the Institute. The Institute will work in close cooperation with the Working Group at the CILSS Secretariat and with the Club Secretariat which is comprised of a three person office (nationals from France, the United States and Canada) and of financial and technical resources which are made available to CILSS and its member countries.

What makes the Club du Sahel Development Program unique is the recognition by all participants that achieving significant development in the Sahel is a long-term process requiring the coordinated efforts of the Sahel countries and donors. This is a process that cannot and is not prescribed in a detailed set of neatly bound plans but provides for:

— Continuous planning and evaluation so that new information based on research findings and actual field experience can be factored into emerging plans;

— Open and frank dialogue between and among Sahelians and donors This continuing dialogue engenders understanding and recognition of special priorities of others. For the United States this dialogue is essential in promoting an increased role for women in development, human rights and family planning.

The Club du Sahel, through its various working groups, commissions and member states, provides the essential forum where Sahelian and donor countries can come together to:

— Marshall the resources necessary to address major development constraints;

— Identify and then analyze common problems such as the financing of local and recurrent costs, cereals pricing and storage policies;

— Agree on long-term development strategies and development priorities;

— Coordinate action plans and individual projects.

During the coming month, the priority activities of the Club du Sahel include:

— refining the individual sector strategies and the overall regional strategy;

— finalizing design of the first generation of projects and facilitating their financing and implementation;

A preliminary schedule of important Club du Sahel meetings is presented below.

1978 Club/CILSS Working Group Meetings
(Provisional List)

JANUARY 1978	
19 January - 3 February	Forestry Seminar Bamako-Ouagadougou
FEBRUARY 1978	
3 February	Meeting of Agricultural Production Team, Ouagadougou
8-9 February	Technical Committee - Mopti Fisheries Project Ouagadougou
13-15 February	Transport Team: Road Maintenance Mindelo, Cape Verde
20 February	Seminar on the Optimization of Agricultural Production Systems Bamako
MARCH 1978	
1-5 March	Review of the Study of Sahelian Middle and High Level Training Needs Institute of the Sahel Niamey
6-15 March	Meeting of Human Resources Team Niamey
End of March	Ecology Working Team
APRIL 1978	
10-14	Meetings with donors on: -- road maintenance projects } PARIS -- fishery projects } -- livestock projects } -- rehabilitation of irrigated perimeters } BANJUL or -- village hydraulics: pumps } DAKAR

MAY 1978

Council of Ministers Meeting
Bamako

JUNE 1978

Meeting with donors on projects Rainfed Agriculture
Dakar

Executive Committee on Crop and Harvest Protection program
West Germany

Technical Committee on New Lands
Ouagadougou

Technical Committee on Storage
Dakar

SEPTEMBER 1978

Rural Health - technical committee meeting with donors
Niamey

Synthesis Group Meeting
Paris

NOVEMBER 1978

Third Club meeting
The Netherlands

DECEMBER 1978

10th Council of Ministers meeting
(to be set)

Annex B: Economic Profile in the Sahel

INTRODUCTION

Economic Structure and Performance

Despite an under utilized resource base, inadequate social and economic infrastructure, and a growing population, the potential for social and economic development in the Sahel is substantial.

The economic well-being of people in the Sahel depends upon such factors as favorable weather for food and cash crops, world prices for imports of petroleum, and skilled labor -- each essential for Sahelian economies to function well and to pursue development programs. Limited government budgets make it difficult for Sahelians themselves to mount investment programs of sufficient scope to increase literacy, raise the skill levels of the work force, and diversify the productive bases of their economies. With the population growth exceeding two percent per year, meeting the goal of raising per capita incomes and living standards becomes even more challenging.

Optimism with respect to the potential for economic development in the Sahel stems from such considerations as:

- Revenues from mineral exports which are being applied to development projects and not to conspicuous consumption;
- National resources which are being mobilized for development efforts throughout the region; and
- Coordination and long-range planning among donors and Sahelians, through CILSS and the Club du Sahel, which has increased the complementarity of projects and reduced the piecemeal nature of past foreign assistance.

The vast majority of the population in the Sahel (90%) continues to reside in rural areas and still depends upon subsistence farming to meet its basic needs. The most recent estimates of per capita GNP (1976) are $100 in Mali, $110 in Upper Volta, $120 in Chad, $160 in Niger, $180 in the Gambia, $340 in Mauritania, and $390 in Senegal[1]. Crops such as groundnuts and cotton provide little cash earnings with which to buy simple manufactured goods and to pay taxes. Table 1 shows the relative importance of each sector of activity to gross domestic product.

---

[1] World Bank, Economic Data Bank, June 1977.

Table 1
Gross Domestic Product at Factor Cost for the Sahel
(current market prices in millions of $)

	1965	1975	Annual Rate of Growth of Output 1965-1975	% Contribution to Output 1965	1975
Agriculture	970.3	1,588.2	4.9	44.3	37.2
Mining	59.1	185.0	11.4	2.7	4.3
Manufacturing	307.9	747.8	8.9	14.0	17.5
Services	854.1	1,748.0	7.2	39.0	41.0
TOTAL GDP	2,191.4	4,269.0	6.7	100.0	100.0
Population (millions)	21.53	27.02	2.3		
Per Capita GDP (dollars)	102	158	4.4		

[1]For this table the Sahel is defined as the Gambia, Senegal, Mauritania, Mali, Upper Volta, Niger and Chad. Source: USAID Economic and Social Data Bank.

The small size and unique characteristics of Cape Verde and the Gambia preclude their inclusion when making general observations about the Sahel. For that reason, the balance of the economic profiles section will address only Mauritania, Senegal, Mali, Upper Volta, Niger and Chad.

From 1965 to 1975, economic growth in the Sahel was negative in real per capita income. Countries with the best economic performance were those with mineral resources such as Senegal, Niger and Mauritania. There was also real growth in the industrial sector. While consumer prices rose at about 7 percent per annum during this period, real output stagnated in the service sector and declined in agriculture. Countries such as Mali, Upper Volta, andChad experienced no real growth because of their greater dependence on agriculture which suffered drastically during the drought years. With rapid population growth, general economic stagnation translated into declining per capita incomes throughout the Sahel. Real growth in per capita income occurred only in Mauritania, but this increase was not widely distributed. The rural population suffered a declining standard of living throughout the Sahel during the decade from 1965 to 1975.

Social Indicators

Poverty is widespread in the Sahelian countries and little progress has been made in improving the quality of life since 1960 when most of these countries became independent. The "physical quality of life index"[1] for the Sahel averages 18 and is among the lowest in the world. For the lowest income countries in the world, the average index value is 39.

Primary and secondary school enrollments have doubled since independence, but only 15 to 43 percent of all children even have the opportunity to attend school. The average life span has been increased only modestly to 40 years. Electric power consumption has more than doubled since 1960. Per capita incomes have risen by 50 to 100 percent in current dollars in Niger, Chad, Upper Volta and the Gambia. In Senegal, per capita income rose by only 27 percent, but in absolute terms, the addition to income was higher than elsewhere, except for Mauritania which tripled its per capita income between 1960 and 1974.

Mobilization of National Resources

Development expenditures for 1975 were at least 30 percent higher than in 1974 throughout the Sahel. Budgeted development expenditures for 1976 were double the 1975 levels in Niger, Upper Volta and Senegal. Revenue collections increased throughout the Sahel in 1974 and 1975 but more slowly than development expenditures.

Since the drought years, current expenditures have increased faster than revenues everywhere except in Chad. In 1975 there were current budget deficits in Mali, Chad and Mauritania. Deficits in Mali continued to increase through 1975 principally because of growth in government salary payments. However, budget surpluses were generated in Upper Volta, Niger and Senegal which were used to increase development expenditures. Deficit countries increased their development expenditures through greater reliance on foreign loans and grants. National budget summaries are presented in Table 2.

Financing Development

Foreign aid to the Sahel has tended to be provided on a grant or soft loan basis. Thus the increasing levels of foreign assistance have not significantly increased current or projected debt service. In 1975, payments of principal and interest on foreign debts amounted to only two or three percent of government revenues.

---

[1]The physcial quality of life index (the index range from 1 to 100 with 100 being the highest present achievement of a state) is computed on the basis of an average of a country's index rating for life expectancy, infant mortality and literacy.

Table 12

National Budget Summaries
(millions of current dollars)[1]

	MAURITANIA						MALI					NIGER				
	1972	1973	1974	1975	Preliminary 1976	Forecast 1977	1972	1973	1974	1975	Est. 1976	1972	1973	1974	1975	1976
Current Revenues	48.2	61.1	85.1	86.0	89.6	110.2	52.9	57.5	62.2	76.3	90.7	55.0	56.9	85.6	105.6	136.1
Current Expenditures	46.0	57.7	74.9	93.3	170.8	192.4	58.8	65.2	71.8	90.8	-	52.7	56.8	65.5	85.5	99.6
Surplus/Deficit	2.2	3.4	10.2	-7.3	-81.2	-82.2	-5.9	-7.7	-9.6	-14.5	-	2.3	.1	20.1	20.1	36.5
Development Expenditures	10.9	11.3	17.4	60.5	82.0	93.0	6.5	5.7	5.5	7.4	-	10.9	11.1	13.4	20.9	44.8
Overall Surplus/Deficit	-8.1	-7.9	-7.2	-67.8	-163.2	-175.2	-12.4	-13.4	-15.1	-21.9	-23.5	-8.6	-11.0	6.7	- .8	-8.3

	CHAD					UPPER VOLTA					SENEGAL				
	1972	1973	1974	1975	1976	1972	1973	1974	1975	Budget 1976	1972	1973	1974	1975	Budget 1976
Current Revenues	53.5	48.1	57.8	65.3	62.1	48.8	52.2	65.3	75.7	90.4	201.5	222.9	287.5	341.8	330.0
Current Expenditures	61.4	59.6	75.2	71.7	72.7	41.5	45.1	49.1	66.3	82.8	187.4	202.4	266.5	309.3	318.0
Surplus/Deficit	- 7.9	-11.5	-17.4	- 6.4	-10.6	7.3	7.3	16.2	9.4	7.6	14.1	20.5	21.0	32.5	0.0
Development Expenditures	3.6	5.0	.2	1.5	-	4.0	5.6	4.3	5.6	13.1	15.9	92.4	11.0	61.7	150.7
Overall Surplus/Deficit	-11.5	-16.5	-17.6	- 7.9	-10.6	3.3	1.5	11.9	3.8	- 5.5	- 1.8	-71.9	-12.3	-31.2	-150.7

Source: I.M.F., Recent Economic Developments

[1]Conversion to dollars from local currency was based on average exchange rates for the period 1972-1976; 211.74 cfa = $1; 467.40 Malian francs = $1; 45.66 ouguiyas = $1.

The question of recurrent cost is an issue for Sahelian countries. Investments in health, education, and infrastructure, typically do not yeild positive returns for 10 to 20 years. Prior to achieving long-term returns, governments must maintain the health and education systems put into place with foreign assistance. For this reason, Sahelian governments anticipate frequent budget deficits for the balance of this century, in order to maximize the benefits from a long-term investment program.

The basic investments needed to realize the full potential of the Sahel require a long-term commitment by donors. The alternative is a series of rescue operations over the next 25 years which may salve the conscience of richer countries, but will be vastly more expensive than the development program needed to place the Sahel on a sound footing for future.

International Payments Positions of Sahelian Countries

The balance of payments structures of the Sahelian economies are typical of developing economies where there are consistent balance of trade deficits which are offset by capital inflows. Although the jump in the post-1973 inflation rate increased Sahelian export earnings, the gains have not been sufficient to pay for the higher priced imports. Thus, the trade deficit has gradually increased. These negative trade balances have been primarily offset by unrequited government transfers, a major portion of which was foreign grant assistance. In comparing the four-year average basic balance figures (shown in Table 3) with the most recent year figures, two of the seven countries have consistently resorted to short-term capital and other means to finance their deficits.

Table 3
International Payments Positions of Sahelian Countries
(in millions dollars)

MOST RECENT YEAR COUNTRY	1976 CHAD	1976 GAMBIA	1976 MALI	1976 MAURTANIA	1975 NIGER	1975 SENEGAL	1975 UPPER VOLTA
GOODS AND SERVICE BALANCE							
MOST RECENT YEAR	-89.3	-19.4	-118.1	-167.6	-72.1	-166.7	-185.9
FOUR YEAR AVERAGE	-81.9	- 8.7	-129.7	- 71.9	-58.2	-127.0	-118.9
GOVERNMENT UNREQUITED TRANSFERS							
MOST RECENT YEAR	68.0	1.4	85.5	138.0	80.0	80.3	97.1
FOUR YEAR AVERAGE	55.0	3.5	79.7	81.6	80.1	73.8	68.0
BASIC BALANCE 1/							
MOST RECENT YEAR	31.3	-14.2	-20.0	4.0	25.1	- 19.3	- 22.5
FOUR YEAR AVERAGE	1.2	2.3	-22.4	15.1	20.8	- 20.9	1.4
DEBT SERVICE RATIOS (%)							
1969	5.0	--	10.7	2.1	4.3	2.6	5.3
1975	5.7	0.6	3.1	15.3	6.0	5.6	5.2

1/ The basic balance includes goods and services, government and private unrequited transfers and long-term capital flows.

Because most capital inflows tend to be on a grant basis and most Sahelian governments practice a conservative financial management policy, debt service ratios (amortization payments plus interest payments divided by total export earnings) have remained relatively low, although the average for the Sahel has increased from 5 percent in 1969 to 6.8 percent in 1975.

The Sahel as Part of the West African Region

The term Sahel refers to a group of countries with a set of common or similar physical, climatic and economic characteristics. However, the Sahel is not an isolated economic region, neither in terms of the regional trade pattern nor in terms of prevailing regional economic agreements. To the contrary, the bulk of regional trade tends to flow between Sahelian and non-Sahelian states.

Table 4
Direction of Recorded Trade of
Sahelian Economies 1970 & 1976
(percent)

	CHAD		MALI		MAURITANIA		NIGER		SENEGAL		UPPER VOLTA	
	1970	1976	1970	1976	1970	1976	1970	1976	1970	1976	1970	1976
TOTAL EXPORTS ($MIL)	29.7	80.5	33.5	70.5	90.1	190.4	31.7	86.4	151.3	425.6	18.8	54.7
EXPORTS TO:												
INDUSTRIALIZED COUNTRIES	73.6	64.7	28.5	70.1	76.8	86.1	65.0	85.9	71.8	81.3	44.6	72.3
(OF WHICH) FRANCE	72.8	16.1	17.1	32.3	19.4	22.8	46.7	82.6	54.6	54.4	11.9	22.4
U.S.	-	1.6	-	1.3	0.7	0.2	0.2	-	0.4	1.0	-	4.3
AFRICA	21.6	5.7	61.2	9.2	2.5	1.0	12.6	5.7	3.5	10.5	46.6	22.3
(OF WHICH) SAHEL	-	-	18.6	1.5	2.3	-	1.7	1.2	8.5	5.5	2.6	1.9
TOTAL IMPORTS ($MIL)	65.0	96.9	44.8	216.6	55.9	219.7	58.4	173.4	190.7	730.8	47.1	139.2
IMPORTS FROM:												
INDUSTRIALIZED COUNTRIES	58.1	73.8	55.3	48.2	61.3	76.7	69.0	79.7	71.2	68.4	65.7	77.3
(OF WHICH) FRANCE	38.9	56.7	38.4	34.3	33.9	43.7	45.8	39.5	51.9	39.7	44.7	50.5
U.S.	3.9	3.7	3.7	1.2	13.4	9.3	5.3	5.4	4.8	6.2	4.5	8.8
AFRICA	19.3	16.6	17.6	3.3	7.7	9.2	12.1	10.9	3.4	4.2	24.7	16.1
(OF WHICH) SAHEL	1.9	2.7	7.0	4.7	6.0	6.5	5.4	1.1	-	-	6.2	2.9

France is the largest single trading partner for each of the Sahelian countries. Trade with non-Sahelian Africa has declined in relative terms since 1970 but has increased in absolute terms. The proportion of inter-Sahelian trade is the smallest with respect to the other major trading areas listed, and the proportion even appears to have declined slightly between 1970 and 1976.

The trade pattern data lead to a corollary which is well known: that the development of the Sahelian economies has been and will continue to be intimately linked with the economic situation and prospects of neighboring countries, particularly the coastal states to the south. The salient characteristics of the present relationship are:

- that the coastal states provide transportation services for Sahelian exports and imports;
- that the coastal states are an important market for Sahelian livestock and grains;
- that the Sahel constitutes a market for a variety of products which can be produced at low cost in the heavier rainfall zone of the coast (wood, fruit, fish); and
- that the coastal countries absorb a significant part of the excess labor force of at least two Sahelian countries.

In 1972, workers' remittances to Upper Volta were approximately $25 million and increased to $38 million by 1976. In Mali, worker remittances were $14 million in 1972 and by 1975 had reached a level of $30 million. For perspective, these sums are equal to approximately one half and one third of government revenues for Upper Volta and Mali respectively.

In practice, the West African economies are relatively open: e.g., six countries (members of the West African Development Bank, BOAD) have a common currency, a common central bank, and common external tariffs. Between 1920 and 1970, a permanent migration from the interior to the coast has added approximately 4.8 million persons to the coastal population and seasonal migration is estimated to have increased from 140,000 migrants per year before the Second World War to 200,000 migrants per year by 1970.

There remain substantial areas for increasing economic integration and cooperation, primarily because existing commercial, communication and transportation arrangements were designed to facilitate ties between individual countries and their former metropoles. River basin development also provides a relatively new and major opportunity for integration.

An ample institutional and historical basis already exists for further economic integration. Influenced by the economic integration introduced by two colonial powers, the West African states tended to establish integration arrangements immediately after their independence. Now there are approximately four organizations which have economic integration as their raison d'etre and at least five other major regional organizations which contribute indirectly to regional integration.

The four principal organizations are the Economic Community of West Africa States (ECOWAS), the Economic Community of West Africa (CEAO), the Common Organization of African and Mauritanian States (OCAM) and the Entente Council. The national membership of each organization is shown in Table 5. In addition, Table 5 lists other major regional organizations which indirectly contribute to regional economic integration.

Table 5
Selected West African Regional Economic Organizations

	ECONOMIC INTEGRATION ORGANIZATIONS				ORGANIZATIONS WHICH EXERT AN INTEGRATING INFLUENCE				
COUNTRY	ECOWAS	CEAO	OCAM	ENTENTE	BOAD 1/	UMOA (BCEAO)	WARDA	OMVS	CILSS
CAPE VERDE	*								*
CHAD									
GAMBIA	•						•		•
MALI	•	•					•	•	•
MAURITANIA	•	•					•	•	•
NIGER	•	•	•	•	*	•	•		•
SENEGAL	•	•	•		*	•	•	•	•
UPPER VOLTA	•	•	•	•	*	•	•		•
BENIN	•		•	•	*	•	•		
CAMEROON									
CENTRAL AFRICAN EMPIRE			•						
GABON			•						
GHANA	•						•		
GUINEA	•								
GUINEA-BISSAU	•								
IVORY COAST	•	•	•	•	*	•	•		
LIBERIA	•						•		
NIGERIA	•						•		
SIERRA LEONE	•						•		
TOGO	•		•	•	*	•	•		

1/ BOAD The West African Development Bank
UMOA The West African Monetary Union
BCEAO The Central Bank of West African States. This is the principal financial institution for UMOA.
WARDA The West African Rice Development Association
OMVS Senegal River Development Organization
CILSS Interstate Permanent Committee for Control of Drought in the Sahel

In spite of an appreciable degree of economic disparity among the West African countries, the performance of these organizations has been relatively good. They have succeeded in maintaining integration as an active agenda item and have kept the member states favorably disposed toward developing increased integration between the Sahel and the rest of West Africa.

Agricultural Resources

The Sahelian economies are basically agricultural. Agriculture, including crop and livestock production, employs approximately 90 percent of the population, except in Senegal and Mauritania, where the shares are 70 percent and 75 percent respectively. Agricultural products are a major source of foreign exchange earnings and they constitute the raw material for much of the domestic industries. Despite the large proportion of the population working in the agricultural sector, usually less than 50 percent of GDP is derived from the sector. This relatively modest share of GDP reflects the low productivity of agriculture and, for certain countries — Senegal, Niger and Mauritania,-- an increase in mining and industrial activities.

Agriculture, as it pertains to crop production, includes commodities which are grown primarily for cash and ultimate export, and food stuffs, which are grown primarily for consumption by the producers, with local sale of any residual amounts. Groundnuts and cotton are the major cash crops with small portions of both commodities going to local consumption. Millet, sorghum and legumes are the principal food crops. Relatively small amounts of rice, wheat, corn and sugar cane are also cultivated, primarily for sale on domestic markets.

Although donor resources are primarily directed to increasing food crop production, it is essential to be aware of the importance of cash crop production. First, the cultivation of cash crops and food crops is inextricably linked through the production process, in which both types of crops compete for the same land and labor resources. Second, cash crop production is a crucial component of rural incomes, a factor of prime concern to the donor community. Third, cash crop production constitutes the main source of foreign exchange for most of the Sahelian economies.

The share of cash crops in total agricultural activity is relatively modest, contributing perhaps 10 to 15 percent of gross value added in agriculture. In 1973 and 1974, approximately two tons of millet and sorghum were produced for every ton of groundnuts and cotton. A yearly average of 2.9 million metric tons of millet and sorghum were produced in 1973 and 1974. Based on 1974-75 production figures, Niger, Upper Volta and Mali are the largest millet and sorghum producers. Senegal and Mali rank first and second in groundnut production, with Chad and Mali being the largest Sahelian producers of cotton.

In constrast to the modest share of cash crops in total agricultural production, earnings from exports of groundnuts and cotton (and cowpeas in the case of Niger) comprise about 50 percent of total export earnings for Senegal, Mali, Upper Volta and Niger. Cotton exports provide Chad with 85 percent of its export earnings. The international prices for groundnuts and cotton have remained at relatively high levels.

There remains a substantial amount of unutilized agricultural land in the Sahel. Even though 8 percent of the Sahel is arable, only 25 percent of this arable land is cultivated. The Sahel contains three major river basins and two lesser river basins, but only .3 percent of that arable land is currently irrigated.

Livestock

Persons dependent upon livestock for a major portion of family subsistance and cash incomes represent 25 percent of the total population of Sahelian countries. Productivity per animal and per unit of grazing land is low with family income of livestock-dependent households estimated to be between $70 to $150 per person.

The sale of live animals is the main source of cash income in areas with less than 20 inches of rainfall. Thus approximately 70 percent of the population is engaged in raising livestock in Mauritania, 20 percent in Niger, Chad and Mali, and 6 percent in Upper Volta. Livestock production averages about 11 to 15 percent of GDP in each of the Sahelian countries, except in Mauritania where it constitutes one-fourth of GDP. Exports of livestock and livestock products vary from 40 percent of total exports in Upper Volta to 20 and 28 percent respectively for Niger and Chad, and near zero for Senegal. Livestock exports fell drastically in 1974 and 1975 but this is abnormal and is not expected to persist.

Industry and Mining

The industrial sector of the Sahel, although small in terms of its share of GDP, is important because:

- it conserves or produces foreign exchange;
- it is, and will continue to be, the principal user of excess labor from the agricultural sector;
- it is an important stabilizing force because it is less sensitive to the vagaries of Sahelian climates; and
- it achieved a positive rate of growth and increased its share of Sahelian GDP from 14 percent to 18 percent during the 1965-1975 period.

Industry is generally limited to producing relatively basic import substitutes and processing agricultural commodities for export. Foreign capital and expertise are involved in most industrial activities in partnerships with host governments. Senegal has the largest and most diversified industrial base, deriving about one-fifth of its GDP from the industrial sector.

Mineral exploitation in the Sahel employs modern, capital intensive techniques and is therefore not a significant employer. Mineral production is becoming increasingly important as a foreign exchange earner for Senegal (phosphates), and Niger (uranium). Iron and copper exports have been a mainstay for Mauritania, where mining accounts for approximately 27 percent of GDP and 70 percent of export earnings. Upper Volta is expected to begin exploiting a manganese deposit and some minor gold deposits. The impending exploitation of oil in Chad and coal in Niger will not only substantially decrease the energy import requirements of these countries, but also will generate new domestic economic activities.

Besides earning or saving foreign exchange, mineral exploitation in the Sahel is important because it provides a stabilizing influence on revenue flows. Mining is the only major activity which is not linked to agricultural production (rainfall) and can help maintain the continuity of development efforts even during dry periods. The non-cyclical nature of mining is reflected in Table 1. Over the 1965-1975 period, mining recorded a real growth rate of about 3 percent annually while other sectors, except industry, had negative real rates.

Fisheries

The Sahel countries have fish-producing waters totalling 9,500,000 hectares of marine coastal waters over the continental shelf and 8,300,000 hectares of lakes, rivers and flood plains. The coastal waters are chiefly along Senegal and Mauritania and 90 percent of the inland waters are located in Mali and Chad.

The annual value of the fish catch to Sahelian countries is $147 million or roughly 4 percent of the regional GDP. Fisher products exported are valued at $96 million or about 16 percent of the value of the export trade for the entire Sahel. While 4 percent of the gross product of the region was generated by fisheries, only 1.5 percent to 2 percent of the total labor force is involved with fisheries. Full-time fishermen in the Sahel region number 160,000, of whom 75 percent fish in the inland lakes and rivers.

Present annual fish production from coastal waters is 1.7 million tons of which 1.3 million tons are taken by foreign vessels, and 400,000 tons are caught by Sahelian countries. The potential sustained annual harvest from the coastal waters probably will not exceed 2.1 million tons. Freshwater production is presently estimated to be 220,000 tons per year. It is estimated that sustained freshwater harvest could be increased to 390,000 tons per year by the year 2000.

In Mauritania, the fishing and processing operations use foreign capital and labor, and the output is exported. Fishing produces over 5 percent of GDP and is expected to reach 10 percent by 1980. In Senegal, offshore fishing is a high growth industry, three-quarters of which is based on

traditional methods. Including the 17 fish processing plants, the fishing industry in Senegal employes over 40,000 workers.

The contribution of fish to the animal protein needs of Sahelian people is high. Per capita consumption of fish averages 14.8 kg while consumption of all other meats is 15.3 kg per person. Subsistence fishing is common during periods of food shortage, and since statistics on this fishing activity are not available, the importance of fish in the diet of poor people is probably under estimated. Fish protein contains a broad spectrum of amino acids which supply sources of essential nutrients lacking in the diet of people consuming only cereal grains.

Like mining, offshore fishing is significant as an economic stabilizer because it is independent of rainfall variations. The foreign demand for fish is expanding and unlike mining, offshore fishing and fish processing provide considerable scope for employment.

Human Resource Development

The importance of human resource development to complement the provision of physical inputs and to bring about technological change is the most significant lesson learned by development planners in the past two decades. The low levels of education/literacy and dependence on expatriate skilled manpower are important constraints to economic development in the Sahel.

Specific constraints to human resource development in the Sahel include:

- Extreme inefficiencies in the national education/training establishments, as measured by high dropout and repeater rates, by low percentage of school-aged children actually enrolled, and by the failure of many who leave school to find employment for which they are even minimally prepared. Illiteracy rates are over 90 percent.

- Shortage of critical skills at all levels, most particularly of those needed to plan and implement rural development (e.g., cooperatives and credit managers, craftsmen, model farmers and herders).

- High rates of migration, both from rural to urban areas, and from inland to coastal countries (especially to Nigeria, Senegal, Ghana and the Ivory Coast).

- The high cost of the formal education establishment (averaging 22 percent of annual national budgets), even given poor quality and low enrollments, reduces the amounts which governments may spend to correct these shortcomings.

- The orientation of the education/training system toward urban, civil service positions, and the complement of this, the popular conception of school as the gate of a salaried career, make for highly theoretical training, entirely in the French language. This orientation runs counter to the preparation of men and women for rural development.

Population Growth

With its population approaching 30 million in 1978 and its land area larger than continental Europe, the Sahel is sparsely populated. In spite of the concentration of populations in the southern areas of Sahel countries, population densities are low and the population is widely dispersed by comparison with many Asian countries. While this dispersion reduces the size of markets and increases the costs of many services, unlike densely populated Asian countries, it also makes it easier to initiate changes in land use, agricultural techniques, and resettlement of populations on under- exploited land.

The momentum of population growth, however, makes it a certainty (barring unprecedented catastrophic events) that the population of the Sahel will at least quadruple by the year 2050. While it may be possible for the Sahelian economies to accommodate such rapid growth, the quality of economic development may be seriously compromised as a consequence. Table 6 presents population growth rates and projected growth for this century.

The problems of adjustment to rapid growth stand out clearly in a context of long-term planning. For example, with growth rates in excess of 2 percent per year, health systems must be doubled in size in less than 35 years merely to maintain the present levels of service. Providing larger proportions of the population with more and better health services requires doubling the delivery of this system in much shorter periods of time.

Health, Water and Nutrition

Disease and malnutrition reduce the amount of work that can be performed by Sahelians and also reduce the productivity of the work that is accomplished. Health problems are exacerbated by poor nutrition, a lack of drinking water and bacterial and viral infections. It has been estimated that total food consumption in the Sahel meets only 85 to 95 percent of the FAO minimum calorie requirements. Infant mortality is higher than in any other area of the world (160 to 200 per 1,000 live births), life expectancy at birth averages under 40 for the region, and crude birth and death rates are extremely high. In addition to the problem of inadequate food, potable water is available to less than 15 percent of the population.

Table 6
Current and Projected
Population in the Sahel

Country	1975[1] mid-year population (000's)	rate of[1] growth (%/yr.)	UN median projection for 2000 (000's)	Crude[2] Birth Rate (per 1000 pop.)	Crude[2] Death Rate	Life[1] Expectancy at Birth (yrs.)
Chad	4035	2.1	5900	44	24	39
Niger	4562	2.6	9600	52	26	39
Upper Volta	5900	1.8	11000	48	26	38
Mali	5677	2.3	11000	50	26	38
Senegal	5000	2.7	9300	48	21	40
Mauritania	1322	2.7	2400	45	25	39
Gambia	519	2.2	900	43	21	40
Cape Verde	294	1.9	400	29	9	50
TOTAL	27309	2.3	51500	-	-	-

Sources: 1. A.I.D. Economic and Social Data Bank
2. U.S.A.I.D., World Economic and Social Indicators, October 1977.

While the cost in terms of lost output is high, the resources available for attacking health and nutrition problems are limited. Annual per capita national expenditures in the health sector average $2.00 and only a small minority of the population receives health services. Although national budgets have been increasing each year, the percentages allocated to health have declined slightly in recent years but still averages between 5 and 10 percent.

Conclusion

The Sahel has emerged from the devastating period of drought relatively well. Although real per capita incomes have declined since 1965, growth in mineral exports and an expanding industrial base have helped offset the downward trend in per capita income. Agricultural productivity has declined, but price increases for export crops have tended to minimize declines in rural incomes and in government revenues.

There remain large areas of fertile agricultural land which can be brought into production over time. River basin development represents an enormous potential in contrast to the current state of uncontrolled river flow. It is possible to make substantial progress in education and health through basic public programs. There are realistic opportunities for increasing rural incomes and productivity through the production of drought resistant varieties, diversification, introduction of new techniques and improvement in marketing and storage techniques.