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REPORT TO THE UNITED STATES CONGRESS

Proposal for a Long-Term Comprehensive Development Program for the Sahel



Major Findings and Programs

April 1976
Submitted by the Agency for International Development
Washington, D.C.

REPORT TO THE UNITED STATES CONGRESS

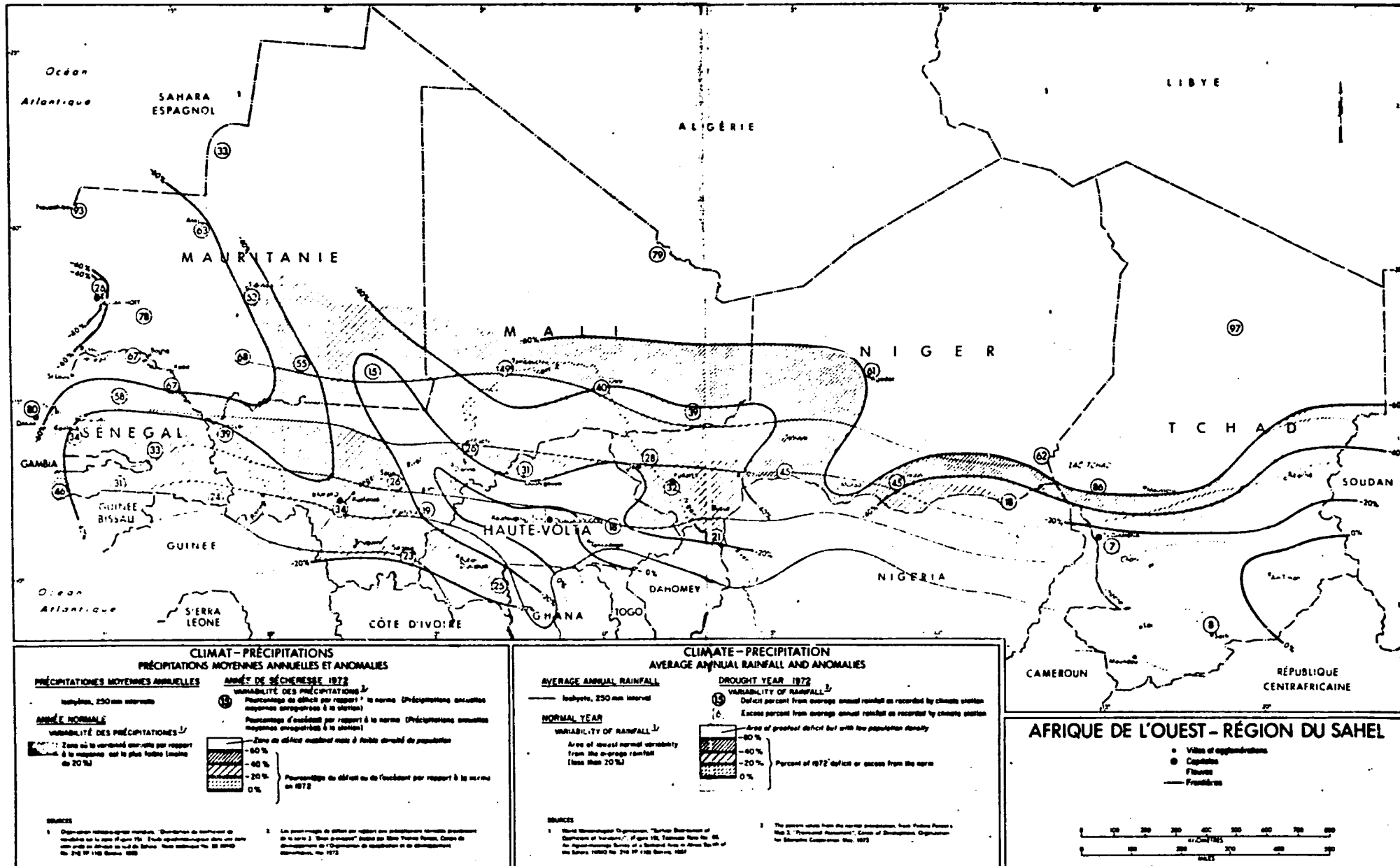
PROPOSAL FOR A LONG-TERM COMPREHENSIVE
DEVELOPMENT PROGRAM FOR THE SAHEL

MAJOR FINDINGS
AND
PROGRAMS

Submitted by the Agency for International Development

Washington, D.C.

April 1976



THE SAHEL

The Sahel is a semi-arid zone of some two million square miles extending in a band approximately between 11 degrees and 24 degrees north latitude across the African continent from the Atlantic Ocean eastward about 2600 miles. It forms the transition between the Sahara Desert and the more fertile areas to the south.

The Sahel includes large parts of six of the world's poorest countries: Mali, Niger, Chad, Upper Volta, Senegal and nearly all of Mauritania. Outside this defined area similar harsh environmental conditions affect the populations of the Cape Verde Islands and Gambia which are, therefore, included as members in the Permanent Interstate Committee for Drought Control in the Sahel (CILSS).

The region is characterized by low and extremely variable annual rainfall with recurrent drought conditions lasting from one to several years occurring at frequent intervals. Average rainfall varies from less than 300 mm annually in the northern Sahelian band to 900 mm annually in the more fertile Sudanian band in the south.

The Sahelian countries include three major river basins: those of the Senegal, Niger and Lake Chad; and two lesser river basins: Gambia and Volta. The flow of the rivers in these basins is extremely variable ranging from flood periods to nearly zero flow in the dry season.

The soils of the region vary, also, from poor soils which barely sustain the most drought resistant varieties of forage plants to rich soils in the Sudanian zone which can, with sufficient water and proper management, be intensively cultivated.

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PART ONE

INTRODUCTION

A. Legislative Background

The human suffering and deprivation of the protracted drought of 1968-1973 dramatically revealed basic and unresolved development problems in the Sahel. The Sahelian relief effort (1972-1974), undertaken by the United States and the rest of the world donor community, was both costly and complex. Through it the donors and Sahel states were made aware that far more costly relief efforts in the future are inevitable unless fundamental changes are made over a sufficient period of time to make the region economically viable.

It was from this perspective that the Congress of the United States first authorized \$25 million for emergency and recovery needs in December, 1973. In an amendment to the Foreign Assistance Act, approved on December 17, 1973, another significant provision was included:

"Sec. 639B. African Sahel Development Program. The Congress supports the initiative of the United States Government in undertaking consultations and planning with the countries concerned, with other nations providing assistance, with the United Nations, and with other concerned international and regional organizations, toward the development and support of a comprehensive long-term African Sahel development program." (Underscore added)

Seven months later on July 8, 1974, even as rains began throughout most of the region, the Congress authorized an additional \$85 million for emergency and recovery needs in the Sahel and other drought-stricken nations of Africa.

During the eighteen months following passage of this legislation, AID collaborated with the Sahelian states and the international donor community to lay the institutional and conceptual foundations of future long-

term planning for the Sahel. Expanding the former Section 639B (now Section 494B of the Foreign Assistance Act) the Congress specified that in developing the Sahel program the President shall:

- "(1) consider international coordination for the planning and implementation of such program;
- (2) seek greater participation and support by African countries and organizations in determining development priorities; and
- (3) begin such planning immediately."

The new section contains a \$5 million authorization for carrying out the purposes of the section. In addition, Section 494B provides:

"The President shall submit to the Foreign Relations and Appropriations Committee of the Senate and the International Relations and Appropriations Committees of the House of Representatives not later than April 30, 1976, a comprehensive proposal for carrying out the provisions of this section which shall include budget materials relating to programs for the fiscal year 1977."

This report is submitted in response to the statutory mandate. It covers the following areas: (1) current international coordination for the planning of long-term development with the involvement of the African countries and organizations, and (2) AID's proposal for long-term development planning for the Sahel.

B. Scope and Methodology

1. Scope of the Report

In submitting this report, AID is proposing to the Congress an approach to formulating a long-term development plan for the Sahel. This report does not

provide the specific details of the recommended long-term development plan. Such a plan cannot be developed unilaterally, but rather must be designed in collaboration with other donors and with the full participation of the Sahelian countries and organizations. This report does provide, however, an outline of constraints to development in the region and offers a course of action which is compatible with the objectives of the Sahelian countries as enunciated in the March 29-31, 1976 meeting of the Club des Amis du Sahel in Dakar.

2. Geographic Coverage

While the report focuses on the Sahelian states, AID fully recognizes that the drought has also had a serious impact on other African countries. However, these countries have suffered only from localized drought conditions of varying intensity spread over extended periods of time.

In Ethiopia, for example, existing development programs have been adjusted and intensified, while studies have been initiated and directed to specific drought problems. AID has joined with other donors to rehabilitate the southern livestock area of Ethiopia, while the IBRD has taken the lead in the north to combat erosion which has seriously affected farm production. However, longer-term studies are needed because periodic droughts, while not as frequent as in the Sahel, have contributed to poverty and loss of life. Therefore, a better strategy for these areas also seems necessary. This year AID has initiated a study of critical long-term ecological problems in East Africa -- e.g., drought erosion, population and food production. The first phase of this study is a preliminary sketch of these problems. This will be followed by meetings with African scholars and officials to analyze those problems and develop a future course of action. In Kenya, AID has agreed to finance an intensive examination of semi-arid and marginal lands leading to the development of specific plans and proposals for their better protection and development. The ongoing livestock development project in the northeast

has been intensified. In Tanzania existing programs in the drought areas have been supplemented and accelerated.

Nevertheless, AID has focused the greatest amount of attention on the Sahel. The international concern for this area, recognizing that drought is a fundamental factor in planning effective development efforts, has produced new international mechanisms, new data, and new opportunities for moving forward in this area in the very near future. In concentrating on the Sahel, it becomes clearer that there are also similarities between the Sahelian states and other drought-stricken African countries which can be addressed in a like manner. These other countries will benefit from knowledge gained by carrying out Sahelian programs discussed in this report. Specific country adaptation will be required because of local situations, but replicability is possible.

3. Methods Used to Prepare the Report

A specially designated Sahel Planning Task Force working under the auspices of the Africa Bureau prepared this report for the Agency for International Development. The Task Force was multidisciplinary and consisted of AID direct-hire employees and consultants primarily from American universities.

The Task Force members met with the other donors and international organizations to solicit their views on long-term development of the Sahel and to obtain current documentation. Members of the Task Force visited Senegal, Mauritania, Mali, Upper Volta, Niger, and Chad and held meetings with officials of African governments and regional organizations. Gambia and the Cape Verde Islands were not visited. Members also visited sites of potential development projects and consulted local technical staffs on proposed projects and plans. Finally, they reviewed many documents, both AID and others.

AID will be prepared to make available to the Congress the detailed background papers on which this report is based. These papers will form an independent volume, now in the final stages of editing and typing.

Membership of the Sahel Planning Task Force follows:

Norman Cohen	Director of Task Force	PFC/DPRE (AID)
Michael Mau	Special Assistant	AA/IDC (AID)
Gerald K. Davey	Special Assistant	ADO (AID)
Dorothy Paquette	Secretary to Task Force	AFR/CWR (AID)
Louis A. Cohen	Engineer - Water Resources	Deputy Director, Regional Economic Development Office Bangkok (AID)
Michael M. Morowitz, Ph.D	Consultant on Anthropology	Professor of Anthropology, State University of New York at Binghamton
Samuel Lubin	Consultant on Infrastructure	Formerly Chief Engineer, Africa Bureau (AID)
Robert J. MacAlister	Consultant on Health	Former Peace Corps Director for Chad; Director, Peace Corps French-Speaking Africa Division
Wilford M. Morris, Ph.D	Consultant on Agriculture/Economy	Professor of Agricultural Economics, Purdue University, Lafayette, Indiana. Diploma in Agriculture (CANTAB)
William M. Rideout, Jr. Ph.D	Consultant on Human Resources	Visiting Professor of International Development Education at the University of Southern California
J. Dirch Stryker, Ph.D	Economist (Consultant)	Associate Professor of International Economic Relations, Fletcher School of Law and Diplomacy, Tufts University, Medford, Massachusetts

PART TWO

MAJOR FINDINGS AND PROPOSED PROGRAMI. International Coordination and Planning

Both donors and recipients in the Sahel relief program have come to accept two basic propositions concerning the future of the region.

Proposition one: That without a fundamental alteration in their systems of production, the people of the Sahel, just to survive, will require even greater quantities of international donations. Weather experts point out that a series of successive dry years, comparable to the last drought, strike the region at least twice every 100 years. Given present growth rates in the Sahel, sufficiently high to nearly double the population by the year 2000 (from 23,000,000 to 45,000,000 persons), and given projected increases in food and transport costs, authorities have concluded that a Sahel relief operation within the next 10-15 years would prove enormously more expensive than the cost of the recent drought emergency. Even leaving aside the expense of emergency assistance, however, the FAO recently estimated that given current production and population trends and provided there is no change in foreign assistance levels which can affect these trends, the Sahel will need to import one million tons of cereals in normal years by 1985. This is the same level of imports as that required at the height of the past drought. These factors convinced donors and recipients alike of the unmistakable need to transform and increase the productive capacity of the Sahel.

Proposition two: That given the great underutilized resources of the region, both in the potential for increased productivity of dry land farming and in the long-term development of the major river basins of the Senegal, the Niger and the Volta River systems, and of Lake Chad, such a transformation of the area's productive capacities is indeed possible -- provided that

adequate infusions of international development assistance are forthcoming.

Agreement on the urgent need for a long-term Sahel development program gave rise to two major institutions. One, which will now figure prominently in the coordination of long-term assistance to the area, is the CILSS (the Permanent Interstate Committee for Drought Control in the Sahel). The other is the Club des Amis du Sahel which is a consultative group of donors and recipients concerned with the long-term development interests of the Sahel.

The CILSS was originally formed by five of the six Sahelian states in March 1973, and assisted by the UN Special Sahelian Office (UNSO) created two months later. The CILSS attempted from the beginning to represent the needs of the member states for donor financing of specific project proposals. In September 1973, the CILSS, representing all six of the Sahelian states, called the first important international conference to address the post-drought period at Ouagadougou, capital of Upper Volta. The United States was represented at this meeting by the then Deputy Administrator of AID, Mr. Maurice Williams. At the meeting, in an action which has influenced the post-drought development agenda, the CILSS presented for donor consideration a list of 300 projects, totalling an estimated \$3 billion, of which the CILSS identified \$850 million as "priority" activities. The following March in Bamako, Mali, the CILSS states set forth three objectives which have fundamental import for a post-drought program in the Sahel. These objectives are to:

- Reduce the consequences of emergency situations in the future;
- Insure self-sufficiency in staple foods (cereals and meat); and
- Accelerate economic and social development, particularly in the least developed countries of the region.

With the end of the severe drought and the resumption of the rains in the Sahel in June-September 1974, the CILSS and the international donor community continued to search out additional ways to bring about a basic transformation of the region in accord with the goals pronounced in Bamako in March 1974. In addition, AID and the Rockefeller Foundation sponsored a conference of select experts on the Sahel. The conference was convened under the auspices of the National Academy of Sciences in Bellagio, Italy, October 24-29, 1974.

By 1975 the donor agencies had completed initial studies which determined the long-term development needs of the region. Among the first of these studies was the Massachusetts Institute of Technology's "Framework for Evaluating Long-Term Strategies for the Development of the Sahel-Sudan Region," funded by AID. Other important studies of the post-drought era in the Sahel were published by the World Bank, the FAO, the UNDP, various French agencies, and by AID itself (Development Assistance Program, 1976-1980, Central and West African Region, revised November 1975). An analysis and synthesis of these studies were carried out recently under the auspices of the Organization for Economic Cooperation and Development (OECD).

While not constituting a strategy for the development of the region, something which only the Sahelians themselves can conceive, these surveys share various assumptions which together appear to form an indispensable foundation for the subsequent development of such a strategy. These studies all suggest the necessity of planning for the Sahel as a single economic entity, including the Sahel's vital ties to contiguous territories, especially those along the coast. Furthermore, the major studies all support, subject to more precise definition, the declared long-term objective of the CILSS: food self-sufficiency in the context of accelerated economic and social development. The major studies are also unanimous in respecting the long-term nature of the task (20-30 years). These studies assume that the comprehensive character of the

Sahel program will necessitate an integrated development in which agronomists, river basin engineers, educators, health specialists, and other specialists must work together. It is expected that no single donor can provide the level or even the types of assistance which are required.

More recently, in July 1975, the CILSS and UNSO sponsored the first post-drought conference of donors in Geneva. The purpose of the meeting was to secure donor support for a list of 56 projects considered ready for near-term implementation and estimated to cost \$154 million. The United States supported the CILSS/UNSO leadership at Geneva and expressed intent to examine 22 of the projects listed, valued at \$25 million.

The events described above also led to the creation of the Club des Amis du Sahel which held its inaugural meeting on March 29-31, 1976 in Dakar, Senegal. Reflecting the collaborative nature of the effort, the meeting was hosted by President Senghor of Senegal and was co-chaired by both President Ould Daddah of Mauritania (as Chairman pro tem of the CILSS) and Mr. Maurice Williams, Chairman of the Development Assistance Committee of the OECD. Representatives of the CILSS states including two of its most recent members, Gambia and Cape Verde Islands, and all major donors and funding organizations (including the Arab Bank for Economic Development in Africa) attended the Dakar meeting. Major sectoral studies by the IBRD (on transport), by the FAO (on agriculture), and by the French (on water resources), among others, were presented.

The institutional character of the Club will be developed over the coming years. Participants generally agree that it should serve as a forum for discussion rather than as another international development organization, but they also recognize that the institution will evolve and change as Sahel development advances. At the inaugural meeting it was agreed that there is a need to continue plenary sessions. The Club also established an international working group which will work from May to November, 1976 to define the goals of the Sahel development

program and to propose a strategy for achieving them. All who wish may join in these deliberations, and special tasks will be carried out by existing agencies. It is intended that the working group will then report to the second session of the Club for discussion of the strategy and for the adoption by late 1976 or early 1977 of a comprehensive long-term development program for the Sahel. It is recognized that such a program will be subject to periodic evaluation and revision as economic, social and political conditions evolve.

The United States Role

AID, acting under explicit Congressional directives, has been a prime mover in the formation of the Club des Amis du Sahel. Under AID's Regional Coordination and Support activity, described in the FY 1977 Congressional Presentation, the United States will continue financial and staff support to the UNSO and to the Secretariats of the Club and the CILSS. In addition, AID will work closely with the new working group and other donors to execute research programs and studies which are required to mount the long-term, comprehensive Sahelian program. AID intends to commit for this purpose the \$5.0 million appropriated by the Congress in April, 1976 for the "Africa Development Program," and the \$5.0 million requested for studies in the FY 1977 Congressional Presentation.

The Administration plans to continue its active leadership role in encouraging increased donor and African collaboration in Sahel development programming, primarily through the Club des Amis du Sahel.

II. AID's Proposal for Long-Term Development Planning for the Sahel

A. General Considerations Essential for Long-Term Development

The Sahel countries comprise an area lying between the desert to the north and the tropical savannah to the south, an area characterized by an exceptionally difficult environment, short growing seasons, highly variable rainfall and cyclical periods of drought. There is also a high prevalence of diseases, some of which impede fuller development of the richer areas near rivers or in the higher rainfall zone immediately to the south. As the traditional zone between the desert and the savannah, the Sahel plays an important role for all of Central and West Africa. Proper management of its fragile ecology determines not only the fate of its 23 million people but also influences that of the heavily populated and more productive countries to the south.

TABLE 1

Aspects of Six Sahelian Countries

<u>Climatic Zone</u>	<u>Average Rainfall/mm/yr</u>	<u>Deviation from Avg(%)</u>	<u>Area (%)</u>	<u>Population (%)</u>
Desert	0-100	60	36	1
Sub-desert	100-300	40-75	28	6
Sahel	300-650	30-45	17	17
Sudan	650-900	25-30	10	60
Guinean	over 900	20-25	9	16

Source: IBRD: World Bank Approach to Economic Development of Sahel, March 1975.

Historically, the people of the Sahel have managed this environment quite well. The grasslands were used on a rotating basis by nomads to support their herds. Agriculture developed a symbiotic relationship to livestock.

The traditional systems are breaking down, however, under the pressure of population growth, occurring in the Sahelian states at rates varying from 2.0 to 3.0 percent per year. As the density of population increases, less land is allowed to lie fallow, and soils are thus depleted. Ironically even periods of better climatic conditions have added to the problem. Together with a relative abundance of rainfall during the 1950s, population growth led to an extension of cultivation into marginal areas. In addition, livestock numbers increased because of these years of favorable rainfall and because of improvements in animal health care. This resulted in overgrazing and depletion of some of the best grasslands, making these areas extremely vulnerable to the recent drought. Finally, the increased population led to increased urban demand for firewood resulting in localized desertification, especially near settled areas.

The severe drought of 1968-1973 brought these problems into sharp focus. During the drought, those who had settled in semi-permanent locations in the northern parts of the Sahel experienced severe losses and sometimes, in desperate attempts to reach better areas to the south, lost everything. Livestock losses were so great, perhaps as much as 30 percent, that many countries felt an urgent need to reconstitute their herds to meet domestic needs and export demands. Farmers, especially in areas far from cities or good roads, depleted their traditional stocks and in some cases abandoned their land for refugee camps. Even the better developed commercial farm areas were severely hurt, with production of peanuts and cotton--vital foreign exchange earners--declining in some cases by as much as 30-40 percent.

While the return of normal rains in 1974 helped overcome the immediate emergency, it was clear that this region could not return to its traditional system and hope to survive. Food production had to be modernized. Traditional livestock systems, which existed on otherwise unprofitable lands, had to be modified to permit greater conservation of the rangelands. Indeed, whole new farming systems needed to be introduced so that farmers could afford to benefit from more of the advantages of modernization. Only in this way could the area become capable of meeting its own basic needs for food and development.

A truly comprehensive development program for this region, therefore, is necessary to build the human and physical resource base needed to withstand future severe droughts without undue disruption to continued development.

1. Food production and agricultural income

The recent drought highlighted the fundamental problem of food production in the Sahel. As shown in Table 2, per capita food production was declining almost everywhere even before the worst years of the drought. This decline contributed to stagnation of per capita income in each country, except Mauritania with its rich iron ore deposits, which contribute little, however, to rural standards of living.

TABLE 2
Changes in Per Capita Food Production and GNP
1961-1970

	Staple Food Production per Head of Rural Population (kg)		Percent Change	Annual Rate of Growth Per Capita GNP 1960-1970
	Average 1961-1965	1970		
Chad	276	184	-32	-0.5
Mali	228	184	-19	0.9
Mauritania	88	75	-14	4.8
Niger	246	216	-12	-0.7
Senegal	212	212	-	-0.8
Upper Volta	180	162	-10	0.4

Source: IBRD-FAO

But the problem is not simply one of total production. If that were the case, these states might simply concentrate on developing export crops in areas of highest productivity, namely, the Sudanian zone and areas near natural water supplies. To do so, however, would fail to deal with those parts of the population most vulnerable to drought. These people usually live in the drier, more remote areas of the region and suffer both from a greater variability of production yield and from lack of accessibility in time of need. They have not benefitted from efforts begun during the colonial period to promote the production of crops for exports since these efforts were concentrated on higher rainfall areas where higher and quicker returns were anticipated. At the same time, this focus on export crops diverted attention from research and development which might have done more to assure the satisfactory level of food supply, especially in these more vulnerable areas. Politically and morally, the Sahel states now recognize the need for a broader based integrated strategy, one that addresses the requirements of the majority of the poorer farmers and herders.

For the Sahelian countries to become totally self-sufficient in staple foods during droughts as prolonged as that of 1968-1973 would be very costly. They have even had to depend on external

aid during moderately dry periods because of their inability to store sufficient reserves during normal years. Yet it is an entirely reasonable and feasible goal for the Sahel states to develop: (a) the capacity to use their own resources to meet the food shortfalls which occur over an average 7-10 year rainfall cycle and (b) a system of information, storage, transport, and distribution which will reduce massive loss of lives and the high cost of coping with future major calamities.

The best way to provide protection against periodic food shortfalls caused by lesser droughts is to promote a comprehensive development approach emphasizing extensive agricultural development during the next 10-15 years by using improved dry land farming techniques, better crop protection, small-scale irrigation activities and farm storage programs. Later, these activities should be complemented by intensive river basin development. These programs will require a heavy investment in roads and communication so that outlying regions can be reached. It will also involve a large investment in human resource development -- on the farms as much as, if not more than, in the schools. This will require a longer period of investment than usual before full returns are realized.

An important aspect of this approach is that it would, where possible, involve both food and cash crops as well as mixed farming with livestock. This would result in important production complementarities, such as manuring of land and crop rotation. It would also provide farmers with disposable income which could be used to purchase fertilizer, improved seeds, and other farm inputs and to invest in health, education, and other ways of improving family welfare. Farmers living in very marginal areas, however, might still find cash crops unprofitable despite improved transportation. In this case, the solution seems to be in developing low cost techniques of preserving or improving soil fertility, such as the use of rock phosphate and rotation involving legumes to fix nitrogen in the soil. Where farming conditions are very poor, people should probably be encouraged to resettle in higher rainfall areas. However, because of endemic disease patterns some higher rainfall areas are now sparsely populated. Disease eradication programs are currently underway to make those lands more available for resettlement. This approach has great advantages in the long

run. It creates a more viable agricultural system throughout the Sahel, and it reaches the rural poor most directly and assists them in improving their welfare. Moreover, it provides for greater environmental protection of the fragile Sahel-Sudanian zone.

In addition to agriculture, the improvement of livestock and fishing presents an important opportunity to increase the supply of food, especially protein, to provide greater earnings for a substantial part of the population and to increase the capacity of these countries to earn foreign exchange. The West African meat market offers substantial profits to producers. Some technology is available to increase production, but more research and development is badly needed. There is an important requirement, moreover, to strengthen the institutional relationships between traditional producers and intervening government agencies in order to provide for more rational exploitation of rangeland and water resources.

2. Water Resources

Water is critical to the survival of the Sahel. Three great river basins exist, largely untapped, within this region, the Senegal, the Niger and Lake Chad, supplemented by the Gambia River and the Volta River systems. Mismanagement of basin development could destroy this one great natural resource of the area. The Sahel states are aware of this danger and have engaged for over a decade in studies, planning and experimentation. Despite their desire to immediately exploit the potential of the water resources, only a few relatively small infrastructure projects, e.g., the Diama and Selengue dams have been brought to the construction stage. More careful planning and many more detailed studies are needed. However, for the full development of West African river basins, these studies should not be delayed unnecessarily over time while the region continues to struggle to feed its people.

Beyond the immediate requirement for self-sufficiency in essential foods and for basic minimum services, the Sahelian states, supported by external agencies, have begun to consider the means by which the region will become economically viable. They have concluded that self-supporting growth can only be realized if the dryland agriculture and livestock economies are

complemented by systems of irrigated agriculture, reliable river transport, and hydroelectric power available for mining and industry. This is the potential of the major river basins which are the most important longer-term hope of the region. A greatly increased program of studies, planning and larger-scale experimentation of the river basins must be initiated over the next fifteen years if this potential is to be realized -- and if disastrous misdevelopment is to be avoided.

Although there are apparently huge underground resources of fresh water, much of this is geologic in origin and is not recharged from the surface. It has been estimated that some 3.6 trillion cubic meters is exploitable, but in order to maintain the equilibrium of the water tables, annual use must be restricted to no more than 12-15 billion cubic meters. However, considering exploitation costs and the requirements for both community water supplies and livestock, the annual usage of groundwater for irrigation could not prudently exceed 2 billion cubic meters, or enough to irrigate only 20,000 hectares in the course of the next few decades. Thus, the primary sources of irrigation water will have to be from efficient management of rainfall and from rivers and lakes as soon as the results of the planning studies and large-scale experimentation are available.

In the interim period, however, this large water resource can be broadly employed for irrigation in small-scale activities to increase agricultural production. The largest single impact on the lives of the farmer that additional water can provide is by ensuring that the rainy season crop has adequate moisture. Supplemental water provided from the major rivers and lakes, wells and from natural and man-made catchments can make this possible on hundreds of thousands of hectares before it is known how and where to build up-stream storage that can furnish water for large-scale, year-round irrigation. Governments and farmers will also be able to gain further experience in adapting to irrigated farming techniques. This implies employing proven techniques used in other arid areas of the world, experimenting in various ways of organizing more intensive irrigated farming, developing research and applying it at the farmer level to determine the best crop combinations under intensive irrigation, and determining how traditional dryland farmers can effectively function under intensive irrigation systems.

3. Human Resources

Essential to the development of this region is the need to train and improve the health of the Sahelian people.

Too little is known about the people of the Sahel. Demographic data are severely lacking, including the mortality and fertility rates and nutritional and health levels of both the sedentary and migrant populations. No accurate census has been taken of the region. The gathering of accurate demographic data is an essential prelude to economic and social planning under any Sahel development program. Present estimates for each of the CILSS countries appear in Table 3.

Among the almost 25 million persons living in the Sahel, representing some 37 distinct ethnic groups, literacy rates are extremely low (see Table 4). Thus the Sahelian states recognize the need to reform the educational establishment. The creation of functional learning systems at the national and local levels will be essential to the success of a Sahel development program. The building of these systems will proceed on three fronts simultaneously:

(1) In primary and functional education, through adapting the primary school system to present day requirements, including the need for the functional education of the parents of school children. A major part of this reform will be the introduction of lessons and materials in indigenous languages, rather than French;

(2) In non-formal education, working through radio, extension techniques, traditional institutions and experimentation with modern technology to reach producers and their families; and

(3) In specialized human resources and management training to meet the needs for trained manpower in agriculture, livestock, fishing, health, water resources, and other key areas. This training will be conducted at secondary school levels and above.

To create these functional learning systems across the Sahel, planners will need to be guided by periodic estimates of changing manpower needs and availabilities.

TABLE 3

DEMOGRAPHIC ESTIMATES

	<u>Chad</u>	<u>Gambia</u>	<u>Mali</u>	<u>Mauritania</u>	<u>Niger</u>	<u>Senegal</u>	<u>Upper Volta</u>
Population (Million)	4.0	0.4	5.5	1.2	4.2	4.0	5.7
Density (Per/Sq. Mi.)	8	88	11	3	9	53	54
Birth Rate (Per. 1,000)	48	42	50	44	52	45	48.5
Death Rate (Per. 1,000)	25	23	27	23	23	21	26
Annual Growth Rate (%)	2.4	1.9	2.4	2.3	3.0	2.4	2.0
Infant Mortality (Per. 1,000)	175	165	188	169	162	159	204
Life Expectancy (Years)	40	42	38	42	43	44	35
Years to Double Population	29	37	29	30	20	29	35
GNP Per Capita (1972, \$)	85	145	70	175	120	285	70
People Per Physican (1970)	60,250	18,750	42,050	17,570	57,480	13,860	74,230

SOURCE: AID, Economic Growth Trends, October 1974

NOTE: Demographic data on Cape Verde Islands is not available. 1974 population figures show 294,000 people.

TABLE 4Literacy and School Enrollment Rates

	Literacy Rates (Percent)	Primary and Secondary School Enrollment Rates (Percent)
Chad	5-10	14
Mali	5	12
Mauritania	1-5	10
Niger	5	6
Senegal	5-10	23
Upper Volta	5-10	6

The health of the peoples of the Sahel is also a major concern, linked closely with levels of productivity. Much needs to be known about the characteristics of the major debilitating diseases of the area (malaria, trypanosomiasis, schistosomiasis, onchocerciasis) and how they may be controlled. Until the Sahelian countries can afford more extensive health care networks, relatively inexpensive preventive care systems need to be established. These systems must serve those areas now affected by diseases and areas to be developed in the future. They must also serve as vehicles for introducing programs on child spacing. Nutrition is also an important aspect of health which is affected by agriculture, fish and livestock production.

4. Infrastructure

The extensive area covered by the Sahelian rural population, long marketing distances and the high cost of an inadequate and inefficient transport system have limited the economic opportunities of the Sahel. Grain surpluses in one region cannot be moved economically into deficit areas, and the cost of transporting meat and other products to the coast is very high. Investments in adequate maintenance and management of roads, railroads, and river transport would, over time, open up markets, reduce the cost of food distribution and increase communications necessary to develop all sectors of economy.

A profile on the number of kilometers of roads and railroads in the Sahel is reflected in Table 5:

TABLE 5

Transport Profile (000 km)

	Total Roads*	Paved	Railroad
Chad	7.2	0.2	0.0
Mali	13.0	4.7	0.6
Mauritania	3.2	-	0.7
Niger	7.3	1.0	0.0
Senegal	9.1	2.2	1.0
Upper Volta	9.0	0.5	0.5

*Classified roads. Does not include dirt tracks.

Source: IBRD

Present energy sources are severely limited. The major fuel for power and heat is wood, the heavy use of which is having a detrimental ecological effect on forest and tree resources. Electric power production is ample to meet present demands but wholly inadequate to support future growth. Hydroelectric production from the major rivers will have to be studied and weighed against competing demands for irrigation and navigation. Other power sources requiring study are geothermal, solar and wind energy.

5. Research and Development

The Sahelian countries suffered for many decades from a lack of an adequate information base in virtually every area. Although important steps have been taken by them to correct this situation, there is an enormous need to support research and development related to agriculture, livestock, fishing, mining and industry, in addition to that described earlier which is necessary for rational development of the river basins. Hopefully, there could be revolutionary advances associated with new technologies, e.g., desalination plants, solar energy techniques, satellite technology for land use planning, crop forecasting and minerals survey. Only if a substantial, broad, and sustained effort is made in all these directions will the potential of these countries be fully revealed.

6. Industry and Mining

The Sahelian states recognize the critical role that agriculture must play in their development in the next few decades. Yet they also realize that ultimately industrialization must assume greater relative importance. Today, only Senegal has any substantial amount of industry, and that contributes only 14 percent to the GNP.

While some industry may effectively complement agricultural development during the next 15 to 20 years, the more important contribution during this period will be in laying the basis for industrialization in the twenty-first century. This will occur through the skills created in existing industry, through the expansion of markets for manufactured goods associated with agricultural development, and through providing the groundwork for hydroelectric power development.

Mining, too, offers the potential of substantial economic resources, but to date, not enough data exist on the mineral resources of the Sahel to propose this sector as a near-term vehicle for development.

B. Time Frame

The foregoing sectoral considerations, while representing the essential ingredients of a Sahel development program, do not by themselves constitute a long-term development program. Following a clearer definition of the program and its goals, these elements must be ranked in terms of a logical time sequence, and estimates of the costs of the program elements must be prepared. An early task of the working group of the Club des Amis du Sahel will be to recommend in detail just such a program framework for approval by both the Sahelian states and the donors by early 1976 or early 1977. This report, however, suggests a time frame and global estimate of the resources required to achieve program goals.

As mentioned earlier, a goal of the CILSS is self-sufficiency in staple foods within a context of accelerated social and economic development. This goal within the integrated development program discussed above and activities underway, suggest a general time sequence which may be divided into near-, medium-, and long-term phases.

1. Near Term (1976-1980)

AID's view of the balanced nature of the program required in the Sahel during the immediate post-drought period is presented in considerable detail in AID's Development Assistance Program for the Central-West Africa Region (revised November 1975). Details

of the specific projects which AID is proposing for this period, together with an overview of the near-term program, appear in the Agency's FY 1977 Congressional Presentation, submitted in February 1976. In both documents, AID recommends that emphasis be placed during this five-year period on food crops and livestock, on rural health, and on training related to key tasks. The Agency also strongly recommends that the U.S. program in the Sahel maintain a balance between projects with a short-term result and those with a long-term pay-off, between national activities and those with a regional perspective, and between projects with an extensive impact (e.g., assistance in dry land farming) and those with an intensive effect (e.g., irrigated farming).

The composition of the projects undertaken in this near-term period, regardless of funding source, has been determined by needs evidenced by the drought and by the requirements of the long-term program. The CILSS list of projects, first presented to donors in September 1973, is itself a significant amalgam of short-, medium-, and long-term activities which range from rural road construction projects in the period immediately ahead to the construction of a regional, locally-staffed hydrometeorological network.

In the 1976-1980 period, several tracks of the total Sahel development program will run concurrently.

-- First, there will be those activities designed to improve directly the lot of rural families in the near-term by applying the resources and technology now available to crop production, protection and storage and other immediately beneficial ends. Examples of this approach are found in the small-scale, local activities not exceeding \$500,000 and of 12-24 months duration which AID has proposed in its FY 1977 presentation as the Accelerated Impact Program. Other examples are the projects initiated since the spring of 1974 with three to five year objectives including such activities as the sorghum and millet production program in central Senegal. While these activities will have a direct impact on the lives of those involved, the number of people affected will be limited, and the projects will represent a learning experience for African governments and donors on new approaches which can later be broadened.

- The second important track of projects in the 1976-1980 period will be the initiation of medium-term programs which also employ available technology but over a somewhat wider geographic area. These are: integrated rural development schemes, broader approaches to dryland farming, regional range management and livestock production programs, infrastructure studies and construction activities, area specific health care and training programs, and the like. These projects will involve the replication and multiplication of short-term projects started under the first track of programs. Although significantly expanded, these projects will still largely represent area-specific programs affecting only a portion of total national and regional populations.
- The third track of undertakings active in this period will be those studies and pilot schemes required to bring into play the entire potential of the area. This will include studies in developing new technologies for dryland farming and planning for the development of the river basins and other water resources of the area. Some development of irrigation will be initiated, and the experience gained will result in better utilization of the river basins. Studies of potential minerals exploitation and industrial development in conjunction with river basin development will be made.
- A final track will be the initiation of training programs and building of institutions which subsequent, broader development programs will require. This will involve training managers, technicians, research scientists, and others who will be needed to manage and design modernized dryland farming, develop river basin facilities, organize and manage health programs, carry on broader educational and training programs, undertake improved transport maintenance and plan for a new transport development.

2. Medium Term (1980-1990)

A major push will be undertaken in this period to extend the productive capacity of dryland farmers throughout the region and to provide the people of the Sahel with a more adequate and equitable distribution of life-support services. It will be essential to continue to expand training programs and institutions which were initiated in the near-term period.

Development in the medium term will continue to be concentrated primarily on dryland farming. This will be achieved by introducing improved dryland farming techniques and by extending and replicating smaller projects and pilot programs undertaken in the earlier phase. Dryland farming will also be made more effective in the medium term by the extensive development of storage systems both at the farm and district levels, of crop protection services, and of information and marketing systems. The latter will include the strengthening of the commercial links between rural areas and urban centers. Programs to improve the commercial off-take of livestock and to improve the management of range resources will go forward.

These efforts in the directly productive sector will be complemented by programs to extend preventive health care, nutrition, and mother/child care programs to all but the most thinly populated areas of the region. At the same time, the trial work which commenced in the near-term period to develop production-oriented literacy programs and community-oriented school programs will be extended to adults and to primary school aged children throughout the Sahel.

Simultaneously, planning will be accelerated for the exploitation of river basins and other water resources. A broad range of sizeable irrigation experiments will be undertaken and diseases, which have prevented development in some areas of the river basins, will be eradicated. The effort in this period will be directed at moving towards the major development of the river basins on the broadest possible basis during the last decade of the century.

3. Long Term and Onwards

Drawing upon studies, pilot projects, training programs, and institution-building activities undertaken in the two earlier periods, the Sahel development program in its long-term phase will seek to tap the larger resources of the region, particularly the major river basins. By phasing in basin development beginning with the Senegal River Basin, the Sahel development program will move from food self-sufficiency towards self-sustaining economic growth in the Sahel and the permanent improvement in the quality of life of its peoples. These conditions will be founded not only on greater yields derived from irrigated agriculture, but from industry (principally agro-industry) and mineral exploitation which hydroelectric power net-

works could be possible. Health services will be expanded to monitor and offset the greater hazard of waterborne diseases introduced by extensive irrigation systems.

As the long-term phase advances, we would look to the balanced development of modernized agriculture, both in dryland systems and in the river basins, complemented by a modern, functional system of livestock production. With the incentives of improved production and marketing systems and with reduced health hazards, population growth will have slowed. As a consequence of these and other factors, the environment of this great band of Africa will be better protected for the future.

C. Resource Requirements

To realize such a long-term Sahel development program, a sizeable transfer of resources to the Sahel countries will be required over the next 15-25 years.

The ability of these countries to amass the resources required for investment and essential recurrent expenditures is limited. Thus, mounting the activities indicated above will require substantial external resources for some period of time. As the economies of the region are strengthened, the Sahel governments will be capable of absorbing an increasing portion of the total burden.

While the total amount of resources required for this effort must still be worked out through the Club des Amis du Sahel, AID currently estimates that about \$5 billion in external aid from all sources, in addition to regular bilateral development programs now underway, will be required over the next 7-10 years. Thereafter, through the remainder of the century, particularly as heavy investments in river basins and other infrastructure are required, it is estimated that about \$10-12 billion in 1975 prices may be required over and above the sums appropriated in the first ten years of the Sahel development program.

These calculations suggest that if long-term development is to be achieved, it can only be accomplished with an infusion of substantial amounts of highly concessional development assistance for the first decade or so. As production increases and a broader tax base is created as a result of the efforts, however, the Sahel governments can do more for themselves and the terms of aid may become harder.

Concessional assistance to the area will involve not only a high proportion of grant assistance and local currency financing, but in the initial years of a Sahel development program, it will also be necessary that a large part of the recurring costs of the newly broadened program be financed by external sources until such time as production increases permit the Sahel governments to provide this financing themselves.

In order to prepare the region for this vast development program, there will be a need in the early years to improve absorptive capacity of the Sahel through substantial training programs, vastly broadened research programs, experimental adaptation of new technologies, institution building and the carrying out of a range of pilot programs. This will all require time and suggests that the donors may have to make some form of long-term commitments. There will also be a need to revamp cost effectiveness criteria to take into account the special problems of the region.

Finally, the paucity of Sahel resources means that the broadest kind of programs must be undertaken if truly comprehensive development, which brings about equitable distribution of benefits to the broadest population base, is to be achieved. Whatever investments are made in improved agricultural and livestock production technology, they cannot be brought to full fruition if production is inhibited by lack of road development. Also over the coming two decades, river basin development must accompany and complement dryland farming. Bringing the populations of the Sahel modernized agricultural production techniques will require improvement of communications. In other words, there must be a comprehensive, interrelated and flexible approach if the goals set by the Sahel people are to be attained.

CONCLUSION

The effect of the Sahel drought (1968-1973) was to expose to the international community the underlying development problems of one of the poorest areas in the world. It also drew a concensus among the donors and recipients of the drought emergency that a comprehensive, long-term development program is essential to prevent the Sahel from becoming an ever increasing drain on world resources. It was recognized, furthermore, that through the full exploitation of dry land farming and the major river basins of the region, prospects of such a program succeeding are encouraging.

In this report, we have attempted to outline both the substance and sequence of a comprehensive, long-term approach to development. We are persuaded that the goals of this Sahel development program are attainable. Through international cooperation, the means to effect this program will help assure its success.

From both the humanitarian and technological point of view, the long-term comprehensive development of the Sahel is a unique opportunity which lies before us today. And the world community can and should accept this challenge.