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**Country Development
Strategy Statement**

FY 1990-1994

MALI

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USAID/MALI
CDSS 1990 - 1994

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A C R O N Y M S

| | |
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| AIDS | - Acquired Immune Deficiency Syndrome |
| AMPPF | - Malian Association for Promotion and Protection of the Family |
| BCEAO | - Banque Centrale des Etats de l'Afrique de l'Ouest |
| BDM | - Banque de Développement du Mali |
| CBD | - Community Based Distribution |
| CDSS | - Country Development Strategy Statement |
| CFA | - Communauté Financière Africaine |
| DA | - Development Assistance |
| DRAG | - Drought Relief Action Group |
| EDF | - European Development Fund |
| EPRP | - Economic Policy Reform Program |
| FAC | - Fonds d'Aide et de Cooperation (French Government Aid Agency) |
| FEWS | - Famine Early Warning Systems |
| FSN | - Foreign Service National |
| FY | - Fiscal Year |
| GDP | - Gross Domestic Product |
| GRM | - Government of the Republic of Mali |
| HRDA | - Human Resources Development Assistance |
| ICOR | - Incremental Capital-Output Ratio |
| IDA | - International Development Association |
| IDI | - International Development Intern |
| IG | - Inspector General |
| IMF | - International Monetary Fund |
| ISNAR | - International Service for National Agricultural Research |
| MOH | - Ministry of Health |
| MT | - Metric Ton |
| NRM | - Natural Resources Management |
| ODA | - Official Development Assistance |
| ODRs | - Regional Development Operation |
| OE | - Operating Expense |
| OECD | - Organization for Economic Cooperation and Development |
| OFDA | - Office of U.S. Foreign Disaster Assistance |
| OMVS | - Senegal River Valley Authority |
| OPEC | - Organization of Petroleum Exporting Countries |
| OPG | - Operational Program Grant |
| ORS | - Oral Rehydration Solution |
| ORT | - Oral Rehydration Therapy |
| OYB | - Operational Year Budget |
| PACD | - Project Assistance Completion Data |
| PACT | - Private Agencies Collaborating Together |
| PD&S | - Project Development and Support |
| PPM | - People's Pharmacy of Mali |
| PRMC | - Cereal Market Restructuring Program |
| PSC | - Personal Services Contract |
| PVO | - Private Voluntary Organization |
| RAPID | - Resource Analysis for Population in Development |
| S&T | - Science and Technology Bureau of A.I.D. |
| SAP | - Systeme Alerte Precoce |
| SOMIEX | - Société Malienne des Importations et Exportations |
| TA | - Technical Assistance |
| TAC | - Technical Advisor for Child Survival |
| UNDP | - United Nations Development Program |
| UNICEF | - United Nations Childrens Program |
| USAID | - Agency for International Development/Bamako |
| USDH | - United States Direct Hire |
| VITA | - Volunteers in Technical Assistance |
| WAMU | - West African Monetary Union |
| WHO | - World Health Organization |

EXECUTIVE SUMMARY

Mali's economy is suffering from years of abuse, often self-inflicted, but also resulting from the vagaries of nature and geography. State intervention in virtually every aspect of the economy, most importantly as it affected the rural economy, was effected with independence. It proved to be a disaster. But it was not until the early 1980s that Mali began a series of reform measures to address those things over which it had a degree of control. These measures have included major efforts to liberate the cereals market from state control; to reduce national budget expenditures, particularly for personnel; to create a more agreeable environment for private sector development and, more recently, to drastically reduce official expenditures for a range of inefficient public enterprises. The government has also taken steps to hedge against those factors over which it has much less control. Making research and extension responsive to the needs of a fragile environment; improved health care for rural populations; a concerted effort to halt the degradation of the country's natural resource base, are among the many concerns of both government and donors. There is a belief that the decisions taken over the recent past are stemming the economic decline experienced since the early-60s and that the trend is up. Certainly, Mali does have the resource base, if not yet the technology, on which to build a solid agriculturally oriented economy.

Poor agricultural performance lies at the heart of inadequate economic growth in Mali. Low rural incomes have inhibited the creation of a market for non-farm goods and services, and the resulting employment opportunities for non-farm people. Chronic food deficits have enlarged the food import bill and diverted scarce foreign exchange from other productive areas. Thus, the primary target of the USAID program in Mali will be rural small farm families, with particular attention paid to women who are key to production increases and family welfare.

The program will pursue the objectives of more efficient resource allocation and increased production, productivity and incomes by addressing three interrelated problems: slow economic growth; hunger and malnutrition; and mother/child health deficiencies.

The USAID strategy for promoting economic growth begins with efforts to restructure the economy and liberalize markets. Approximately 39 percent of Mission resources have gone/will go directly to this effort over the period of the last five years and the proposed CDSS. Most of this is in the form of non-project assistance to support cereals market liberalization; improvements in financial markets; budget management; regulatory and licensing controls; tax and customs rates; and business advisory services and training for private enterprises, all of which are needed if the private sector is to operate effectively. The project element of the portfolio, confined largely to Mali's productive Second Region, is also being used as a tool for macro and sectoral policy changes, particularly the privatization of agricultural input and credit delivery; restructuring of the government rural development operations; the development of cooperatives as private sector entities; user or service fees for cost recovery; and the privatization of both family planning services and veterinary medicine.

Mali's principal donor partners agree on the approach to the problem of inadequate economic growth, particularly on the economic reforms which are needed. The multi-donor Cereals Market Restructuring Program; U.S. and French consultations on budget reform; donor consultations on the World Bank Public Enterprise Restructuring Program; and multi-donor approaches to agricultural research and extension are examples of where concertation of donor dialogue and funding is beginning to produce results. However, the generation of employment, urban and rural, is a major effort facing both the government and the donors. Restructuring the public enterprises and the national budget has

resulted in unemployment of the educated middle class on a scale which Mali has not known. The political and social consequences are obvious; the solutions less so.

The policy reform agenda of the CDSS is the first response to the problems of hunger and malnutrition. This agenda will be complemented with a program to develop and disseminate appropriate technologies for rain-fed crops and livestock, to facilitate private sector delivery of goods and services to the rural areas, and to motivate farmers to increase production.

Based on several sub-sector studies, the Mission determined that mother/child health deficiencies are a serious constraint to economic growth and that AID resources and U.S. expertise can and should address the problems. Immunization, oral rehydration therapy, malaria treatment and nutritional deficiencies are the basic child survival elements of the program. USAID, through its family planning program, will continue to be virtually the only donor addressing a dangerously escalating population growth rate which is affecting mother and child health and economic growth.

Added emphasis is being given to program performance monitoring, in its entirety and among its discrete elements. A special effort will be made to monitor and evaluate the economic reform elements of the program and to measure the impact of the totality of the program and projects on rural production and incomes in the Second Region.

The USAID Mali program, over the life of the CDSS, is predicated on an OYB straightlined at \$12 million and OE funds kept at approximately current levels. Program consolidation which has taken place over the past five years has reduced the management burden. This, combined with a major successful Mission effort to Malianize program monitoring, can permit a reasonable reduction in USDH staff without compromising effectiveness or increasing vulnerability to unacceptable levels.

I. DEVELOPMENT OVERVIEW

A. The Socialist Years

Since attaining independence in 1960, Mali has experienced relative political stability, with only one change of government and two heads of state: Modibo Keita from 1960-1968, and Moussa Traore from 1968 to the present. Keita chose the socialist path to development, expanding the power of the administration and the party while curbing that of the private sector. Civil service rolls burgeoned as the government guaranteed employment to all school leavers at the secondary level and above. The state took over most banking activities and private industries of any significant size. With Communist bloc assistance, the state also set up new public companies such as SOMIEX which was vested with the monopoly on external trade.

Based on the surpluses it thought could be generated by state enterprises and taxes levied on the rural economy, the state hoped to finance rapid urban-based industrialization, and to make traditional agriculture, spurred by taxation and extension efforts, undergo a technological transformation that would enable it to feed urban residents at low prices and produce crops for export. Accordingly, the government attempted to set producer and consumer prices and to take charge of cereals marketing. Under Keita there was also an attempt to organize smallholdings into collective farms. Mali left the West African Monetary Union, adopted the Mali franc as its currency, and financed its development budgets by borrowing heavily from the country's central bank which also doubled as the development bank.

The socialist path proved to be the road to disaster. The Mali franc quickly became overvalued and inconvertible. Inefficient state industries, lacking managerial expertise and the discipline of a free market, turned out shoddy goods and incurred losses, draining state revenues. Low producer prices and controlled marketing soon saw farmers reverting to subsistence

production. Budget deficits and external debt mounted. As the economy declined and opposition mounted, Keita signed an agreement with France in 1967 which rescheduled debt; gave French backing to the Mali franc, making it convertible; and reinstated a measure of monetary and credit discipline. These moves, however, came too late to save his regime.

In 1968 a group of army officers led by Lieutenant (now General) Traore seized power. Traore has successfully mediated disputes among unionists, controlled disgruntled army officers and maintained a politically stable, one-party state. His regime recognized many of the problems it had inherited but was slow to reverse course. It continued to guarantee employment to all school leavers until as late as 1983. Partly at donor behest, it created regional rural development operations that further expanded government employment opportunities. Early attempts at reform, such as increases in agricultural producer prices, were overtaken by a series of shocks to the economy, including oil price increases and the devastating 1972-74 drought. Production recovered but once again plummeted during the drought of 1982-84, with crop output in 1984 declining by 20 percent and the national livestock herd being decimated by 35 percent. Despite high levels of external financial support, the combined effects of droughts, shifts in terms of trade, inefficient state management, misallocation of resources, corruption, inflation, and counter-productive tax and pricing policies led to a major fiscal and balance of payments crisis by the late 1970s.

B. Shift in Course

Since 1980 Mali has undertaken significant policy and economic reforms. She rejoined the West African Monetary Union in 1984. Other reforms, facilitated by policy dialogue with donors, were carried out within the context of projects such as the World Bank's Mali Sud II, three successive IMF programs from 1982-86, A.I.D.'s Economic Policy Reform Program, and the

multi-donor program to restructure the cereals marketing system. Notable accomplishments include: the ending of state control of coarse grain markets and prices; abolition of rice subsidies; payroll cuts of several thousand employees from the rolls of state enterprises operating at a deficit; elimination or privatization of several of the enterprises; restraints on civil service growth; reduction of payroll and business tax rates; and adjustment of customs duties to remove biases against domestic production. In addition, the government has recently begun legal dissolution of six non-viable regional development agencies.

Progress towards economic stabilization and privatization slackened somewhat when Mali failed to stay under credit ceilings for the last two quarters of its third IMF Standby arrangement (late 1986) and proved unable to agree to terms on the World Bank Public Enterprise Restructuring Program. As of early 1988, however, prospects for a new IMF agreement are very promising and negotiations on the World Bank project are nearing conclusion.

C. Prospects for the Future

At first glance, Mali's prospects for achieving self-sustaining growth over the next decade or two seem remote. Among the development constraints are highly variable rainfall and recurring droughts; a threatened natural resource base; volatile terms of trade with a limited range of export products (principally cotton, livestock and gold), and dependence on costly imports such as petroleum and machinery; an overhang of debt which will constrain growth of GDP for years to come; a narrow domestic market for current domestic manufacturing capacity; deteriorating infrastructure; inadequate technologies, particularly in the key agricultural sector; low marginal productivity owing to the above factors and to rapid population growth, rural out-migration, high illiteracy, poor health, and low producer/investor incentives; and a continuing set of deep-seated problems in fiscal, monetary and credit policy

and in public service and public enterprise management. In addition, the failure of many former state enterprise employees, recent school graduates and others to find private sector employment has become a major issue with significant humanitarian and political dimensions.

As with policy reform, the development record in technical areas has been mixed. Attempts during the 1970s to adapt improved Asian crop varieties to Mali were disappointing. Rice yields have stagnated for more than a decade. On the other hand, coarse grain yields have risen, while new cowpea and maize varieties, animal traction and forage cultivation have been adopted by farmers. Yields for cotton, Mali's major foreign exchange earner, have increased and production was little affected by the droughts. However, falling world prices for this commodity have been a more influential factor in determining its viability for the rural Malians.

Nevertheless, policy and operational changes of the last five years give ground for confidence that the country's leadership will continue to undertake difficult economic reforms, will act to enhance the role of the private sector in the economy, and will move forward, with the donors, on plans to restructure rural development operations. Continued budget and balance-of-payments support from donors, however, will be needed to help ease the transition. Important resources enhancing Mali's development prospects are a relatively cohesive society with a history of political stability; no significant ethnic rivalries; a tradition of private commerce; and physical attributes including large areas of still uncultivated arable land, abundant rainfall in the south, and substantial river systems and irrigation capacity in various parts of the country.

D. Donor Coordination

There is every reason to believe that the major Western donors are fixed on the same global objectives and are using both formal and informal

coordination fora to arrive there. Donor coordination in the abstract, however, has not been productive. (See 86 Bamako 7554 for our assessment of the Donor Round Table Process). Strong government/multi-donor partnerships, focused on issues on which there is already a broad consensus, have produced the most important successes of the past five years and hold the most promise for the future. While much remains to be done, the highly coordinated and adequately funded cereals market reform program has overseen the liberalization of the cereals market and the growing involvement of the private sector in all aspects of marketing. IMF, A.I.D. and French coordination on budget restructuring and fiscal reform will benefit the economy. The World Bank program for restructuring of the public sector, supported financially and/or vocally by the major donors, is a positive step in the general plan to clean up the economy. Coordination by the World Bank of the major donors financing irrigated rice production in the Office du Niger has promise to improve management and reduce production costs and make Mali more competitive. Restructuring of the rural development operations (ODRs), again being coordinated by the World Bank, is another avenue of promise to directly involve the private sector to achieve food security objectives. The A.I.D.-financed Haute Vallee project will be the first to initiate a major ODR restructuring and promote involvement of the private sector in credit, input delivery and transport activities. Fully coordinated programs for disaster and drought relief, spearheaded in large part by the Mission, have been very successful. The latest effort is to formalize a donor/government Secretariat to research constraints which are inhibiting the ability of the private sector to grow and create employment, and to develop for immediate implementation an action plan including additional economic reforms such as measures to make credit ceilings and interest rates more flexible.

II. PROBLEM DESCRIPTION AND ANALYSIS

A. Inadequate Economic Growth

1. Basic Economic Growth Trends

a. Gross Domestic Product. Mali remains one of the poorest countries in the world with a per capita income of around \$207. Total GDP in 1986 was \$1.67 billion for a population of about 8.2 million. Agriculture makes up about half of GDP; commercial and industrial activity comprises the remainder. For reasons analyzed below, GDP over the last decade has barely grown 2 percent per year on average in real terms. During the period 1977-81, real GDP grew by 2.7 percent per year; the rate dropped to less than 1 percent over the next five years, largely because of the 1982-84 drought. Investment relative to GDP has averaged 20 percent, but a high and unstable incremental capital-output ratio (ICOR) -- owing to poor investment choice, inefficient statist management, and a distorted price structure with resulting misallocation of resources -- has produced low returns.

In an effort to improve the structure of incentives and spur production, the GRM since 1981 has implemented a significant series of reforms, including complete liberalization of the market for millet, sorghum and maize; abolition of consumer rice subsidies; and an end to monopsony and monopoly privileges for state import-export and grain marketing organizations. These reforms have been strongly backed by the IMF, the World Bank, A.I.D. and other donors. However, because of a variety of constraints -- policy, institutional, financial, technical, educational, health, labor and environmental -- to be discussed in this paper, these economic measures and other reforms cited below have only begun the task of putting the economy on a growth path.

b. Fiscal Trends. Government spending has reached about \$277 million per year or 17 percent of GDP exclusive of donor-financed project outlays. Including donor-financed spending of \$250-\$350 million per year

(mostly on projects), Mali's consolidated public expenditure equals between 31 and 38 percent of GDP, one of the highest consolidated public expenditure/GDP ratios in the world. Government revenues, derived mostly from indirect taxes, income taxes and customs duties, are less than \$257 million per year. This deficit of about 7 percent of government expenditures compares favorably with a deficit equal to nearly 20 percent of expenditures in 1982. The reduction has been achieved through measures to control expenditures and increase revenues in the context of donor-supported reform programs. To shrink the deficit the government has taken a number of difficult steps. It has severely limited civil service hiring, promoted voluntary early retirements, imposed tighter controls on all official spending, frozen cost-of-living adjustments and other current expenditure levels, strengthened customs and tax administration, raised utility rates, ended cotton input subsidies, and begun privatization of state enterprises whose large staffs and operating losses were draining the treasury and the banking system. Nevertheless, the GRM treasury remains woefully short of funds, as evidenced by current delays of three to four months in salary payments to government workers.

c. Monetary Trends. In 1984 Mali rejoined the West African Monetary Union and began using the CFA franc, a fully convertible currency pegged to the French franc, in exchange for adherence to the tighter rules and limitations of the Central Bank of West African States (BCEAO). Adherence to the rules has proved difficult, however. In 1987, responding to excessive borrowing by the GRM and the rest of the economy in late 1986, the BCEAO tightened Mali's credit ceilings and conditions. To cut public enterprise losses and borrowings, the GRM is planning various steps, including further staff reductions in the enterprises. The Malian Development Bank (BDM), which accounts for 70 percent of credit to the economy, needs complete restructuring or replacement with the help of external donors for the economy to have access

to adequate credit levels. Mali's third standby arrangement with the IMF expired in April 1987 after credit and government borrowing ceilings had been exceeded in late 1986. Negotiations on a new agreement continue.

d. Foreign Debt. Mali's foreign debt exceeds \$1.7 billion (about equal to GDP) of which about \$1.3 billion is owed to bilateral lenders (France, the Soviet Union, China and Arab oil-exporting countries) and the balance to international development banks and the IMF. Mali has rescheduled many of its bilateral debts and is renegotiating additional debt on which payments are in arrears. At the same time, Mali is servicing an increasing proportion of scheduled debt. Actual debt service required 6 percent of export receipts in 1982, while scheduled debt service amounted to 19 percent of export receipts. The comparable figures for 1986 were 30 percent and 38 percent, respectively, showing both a heavier debt servicing burden and an improved payment record. Debt servicing charges increased sharply in the early 1980s and will remain high as a result of expiration of grace periods, higher interest rates, and cumulative debt buildup. The high ICOR noted above has resulted in low returns to borrowing which in turn has accelerated the debt buildup relative to GDP and export receipts.

e. Balance of Payments. The volume of exports and real foreign exchange earnings have increased in recent years while real GDP growth has been sluggish. During the years 1982-86 export volume grew at an average compound rate of 7.6 percent per year, compared to -1.03 percent per year over the period 1977-81. Cotton and gold exports are chiefly responsible for the growth in the last five years; livestock exports increased during the drought years of 1982-84 through distress sales but declined from 1985 onward as herds were being reconstituted following the return of good pasture conditions.

Unfortunately, the dramatically better export performance of 1982-86 was accompanied by sharply increased external debt servicing obligations -- now

equal to about 39 percent of export receipts -- and by continued growth of import volume. The latter, chiefly petroleum, vehicles, other manufactured goods and cereals, grew at an average rate of 4.5 percent from 1977 through 1986, with the rate increasing to an average 5.96 percent during the last five years of that period. The result was that from 1977 to 1981, the current account deficit (before official transfers) climbed steeply, rising from 46 percent to 140 percent of export receipts. Since 1981 the deficit has fluctuated between 100 percent and 150 percent of export receipts. In 1986 the current account deficit reached 150 percent (\$287 million), while the trade deficit reached 130 percent (\$245 million).

Official transfers -- foreign assistance grants -- typically cover about 50 percent of the current account deficit. The balance is financed by loans, mostly long-term and on highly concessional terms, from official bilateral and multilateral agencies. Most of the loans and grants are project-related. France has been the largest donor.

f. Employment. Mali's population is increasing at a rate of 2.7 percent per year, well in excess of GDP growth. Urban areas are growing by 6.7 percent and rural areas by 1.7 percent per year. The agricultural sector at present employs between 65 and 70 percent of Mali's adult population (out of the 74.2 percent who live in the rural areas). There is a net migration from the countryside into the cities of about 70,000 people each year, most of them in the 15-40 year age bracket seeking work in construction, hauling and other unskilled trades. If the rural out-migration continues at the current rate, the percentage of the population in urban areas can be expected to rise from 25.8 percent at present to 30.6 percent by 1993 and to 38.2 percent by 2000. For Mali to be self-sufficient in food, which it is not, the marketed surplus produced by 100 people in agriculture today would have to feed almost 35 urban residents, compared to eight city dwellers 20 years ago. Projecting

present population trends, 100 farmers would have to feed themselves and 61 others in the year 2000. However, since the marketed food surplus over the years has in fact remained constant as a percentage of total production, food imports have had to rise. Given the low rates of productivity increase in cereals output and insufficient export earnings to cover the rise in food imports, a foreign exchange gap has emerged that is stifling credit expansion, economic growth and employment generation.

With current rates of economic growth, rural-urban migration and production of secondary-school and post-secondary graduates, it is widely believed that productive employment opportunities are not keeping pace with the growth in the labor force, particularly among urban school graduates and dropouts. These persons seek white collar or skilled manual labor positions. Each year they include about 2,300 secondary and technical school graduates plus 500 dropouts or repeaters, and about 1,000 university graduates plus 300 who leave before graduation. The civil service recruits about 500 a year (down from 2,000-plus a few years ago). State enterprises faced with insolvency are continuing to lay off people, most without severance pay; over the past five years, some 3,000 employees have been dismissed. However, not all state enterprises have laid off workers. From 1981 to 1986, total employment in state enterprises apparently expanded by 891, or by 180 per year. Modern private sector employment (i.e., in registered, privately-owned tax-paying firms) grew by some 2000 from 1981 to 1986, or by 400 per year. Hence about 2,500 out of 3,600 secondary and tertiary school leavers each year plus dismissed employees presumably must either find employment in the traditional private sector, migrate to other African countries or to France to find temporary employment, or remain unemployed. Compounding the employment problem is the decline in effective purchasing power induced by late payment of civil servants and a severe credit crunch. The late payment and credit

problems may be relieved for a time if and when the GRM reaches agreement with the IMF and the World Bank on new assistance flows.

2. Low Income Levels and the Key Role of Agriculture

Data on Malians' incomes are very sparse. A recent urban expenditure survey reveals that total per capita annual expenditures for the lowest quartile range from \$143 in Gao, a poor northern town, to \$228 in Bamako. The figures for the next higher quartile are \$228 for Gao and \$348 for Bamako. These figures understate income since they account only for expenditures, excluding income saved and in-kind income from urban family food production which is widespread. Indicators of rural incomes are available only for the two most productive farming zones in the country (Second and Third Regions). In the Second Region, the majority of households have neither the production nor the income to secure the amounts of cereals they need for consumption (calculated as 180 kg./cap/yr.), most likely leaving them undernourished.

A principal cause of low incomes in Mali is that agricultural growth has been inadequate. The exact growth trends in cereals output are not clear. Two different 16-year data series, and the problem of choice of base period in a highly variable situation (e.g., drought in 1982-84 and exceptionally good rainfall in 1985-86), allow one only to say that growth in per capita output of cereals has been minimal. Agricultural statistics in Mali have been improved over the past three years: a major gap in coverage has been filled, consistency has been established between the two series, and major refinements have been made in data collection and analysis. By the end of the upcoming CDSS period it should be possible to obtain clear trends in agricultural production from 1984 onward.

Agriculture has failed to fuel economic growth for several reasons. First, poor agricultural performance has kept rural incomes too low to create a broad-based market for the non-farm goods, services and employment through

which increasing numbers of non-farm people need to gain their livelihood. Second, agricultural development efforts have failed thus far to reduce the cost of rice, a key wage good for salaried employees. This has not only kept real incomes of rice consumers lower than they would have been, but has raised the political cost to the GRM of undertaking necessary but painful economic reforms. Third, natural resource degradation owing to population pressure, declining rainfall and poorly defined use rights threatens to reduce crop yields and hence incomes of poor people.

Fourth, chronic food deficits have led to the use of scarce foreign exchange for commercial food imports averaging 114,000 MT per year for the past 11 years at a cost of \$30 million a year -- equivalent to half of cotton export revenues during the period. With world rice prices variable but generally high, food import needs rising with population, and world cotton prices stagnant, even major growth in cotton output may not prevent an increasing proportion of cotton revenue having to be used for food imports. Present trends continued to the year 2000 could see the food deficit rising to as high as 730,000 MT per year according to Mission calculations.

This, however, is a worst-case scenario that need not occur for a number of reasons. First, Mali has a solid resource base which can sustain increases in agricultural production in an environmentally sound manner. The extensive southern part of the country, falling outside of the Sahel zone, is an agriculturally rich area with fairly high and reliable rainfall. Even some riskier rainfall areas north of this zone have sufficient rainfall and soil resources to see increases in rainfed production. Analysis of potential area, yield expansion and irrigation costs suggests that most of Mali's crop production increases in the next few years are likely to come from increased yields from rainfed areas, rather than from expanding irrigated area.

Second, Mali's livestock herd of more than 10 million large and small

ruminants provides some income to half or more of all rural people, contributed 18 percent to GDP in the 1981-85 period, and generates almost half of export revenues. Most of the animals use dry rangeland which would otherwise be unproductive. Increasing use of crop areas for pasturing has led to incidents of resource competition and land degradation. To overcome these problems, the GRM is seeking to increase the complementarity of crops and livestock through mixed farming techniques. The southern regions could absorb substantially greater numbers of livestock as farming systems increasingly integrate forage production on fallow land, animal power and composting of animal waste for fertilizer.

Lastly, Mali's policy and institutional environment is now more favorable to agricultural growth than was the case five years ago. Farm prices are no longer held well below market rates. Agricultural extension organizations are increasingly focused on technology diffusion, divesting other tasks to the private sector.

Even in the poor policy and insitutional environment of the 1970s and early 1980s, farmers were able to make major improvements in productivity in some areas. This period saw extensive adoption of improved cotton cultivation techniques which raised yields to the highest levels in West Africa; of animal power, more widely used in Mali than elsewhere in West Africa; and of new corn, cowpea and sorghum varieties. Sorghum and millet yields increased by an average of between 0.8 percent and 1.5 percent per annum. All of these improvements were based on agricultural research and extension.

Among the key constraints that remain to be addressed are (a) production risk, resulting from highly variable rainfall and pests; (b) soil deficiencies, characterized by low fertility, poor structure, limited moisture-holding capacity and degradation; (c) market risk, where insufficiently developed food crop marketing and credit institutions, and a

poor farm-to-market road network and livestock facilities have placed all or most of the price risk on farmers and herders; and (d) the tremendous burdens placed on farm women, who perform 60 percent or more of the agricultural labor and contribute nearly 100 percent of their income to family support (compared to 35 percent for men), yet who suffer from an extreme lack of capital, education, credit, access to transportation and, not least important, time. All these constraints must be addressed in combination. Attacking one problem to the exclusion of others will yield unsatisfactory results.

3. Recurrent Droughts and Other Emergencies

There has been a major drought in every decade of Mali's recorded history. The effects have resulted in temporary but serious declines in agricultural productivity, decimation of livestock and small herds, increased incidence of human and animal disease, death, permanent damage to the natural resource base, and often overwhelming economic setbacks. Steadily declining rainfall levels, the frequency of droughts, and traditional agricultural grazing and production practices have made it virtually impossible for the land to heal itself.

The economic costs to Mali can never be accurately calculated because of the wide-reaching effect drought and other natural emergencies have on the entire development process. One might surmise that the diversion of financial and human resources from planned development activities during drought and low-rainfall years is just as critical as the drought itself. An analysis of the situation during natural emergencies indicates that the government is ill-prepared. The Government of Mali had in the past, as had many other countries, adopted short-term solutions to frequent drought emergencies. These solutions often proved to be too temporary in duration and inadequate in scope. Instead of tracking grain reserves, evaluating storage capacity and monitoring production data to determine when and where to make shifts of food

stocks as a matter of course, these actions were left until the effect of the drought began to take its toll on the environment and its inhabitants.

B. Hunger

Acute and chronic malnutrition are both present in Mali. The most visible cause of acute malnutrition is recurrent drought and food shortage, especially in the north. Since the major drought of 1982-84, extensive surveillance to detect acute malnutrition has taken place, mainly in the north, with a common method standardized on weight-for-height. There have been very few studies of chronic malnutrition (weight- or height-for-age). There has never been a national nutrition, consumption or expenditure survey, although an urban expenditure survey was recently completed and will soon be extended to include expenditure and nutrition in rural areas.

Estimates of percentages of children under five who fall below the 80 percent weight-for-height threshold for acute malnutrition range from 1.5 percent to 43 percent of the group, with a below-threshold average across all the surveys of 14 percent. This range is consistent with the more limited nutrition surveillance done prior to the 1982-84 drought, indicating neither improvement nor decline in acute child malnutrition. It is important to note that of the children under the threshold, more than 90 percent are moderately rather than severely malnourished. The number of severely malnourished children (below 70 percent of the weight-for-height threshold) ranges between zero and 10 percent, averaging 1.8 percent across the recent studies. This is a clear indication of the importance of emergency food assistance.

There are two sets of causes of inadequate nutrition. The first set is related to acute undernutrition in successive drought years. Inadequate household production, inadequate income to purchase grain and other foods, and (until recently) institutional constraints have led in such years to severe shortfalls in caloric consumption. The institutional constraints in the past

prevented timely food supplies from reaching groups at risk of malnutrition and hunger. A national drought committee established over the last five years has greatly improved distribution of food aid, although problems remain.

The second set of factors causes inadequate nutrition even in normal years. These factors include:

- rural households with low rates of technical adoption which produce insufficient amounts of grain for home consumption and also lack the off-farm income needed to purchase the difference (a problem for many households, including about a third of those in the favored southern zones, even in years of good rainfall);
- poor urban households whose income is insufficient to meet calorie consumption requirements. High income elasticity of demand for basic caloric food staples among all urban income groups indicates inadequate calorie consumption, meaning that any loss of income is likely to reduce caloric and nutritive consumption;
- dietary and feeding preferences which cause or exacerbate undernutrition and malnutrition in pregnant and lactating women and young children, e.g., the custom of women and children eating last and often receiving the less nutritional elements of a meal; and
- health problems, such as diarrhea, which reduce nutritional absorption.

The last two factors, dietary preferences and health, are unrelated to agriculture and are found among all income and ethnic groups. These factors may account for the very poor nutritional levels found among a substantial portion of the population in the three nutrition surveys done in the richest agricultural area (Region III) of the country, where acute malnutrition was found among more than 20 percent of the under-five population.

The Nutrition Service of the MOH is charged with all nutrition activities but lacks staff, direction and resources. There is a need for standardized reporting methodology and better understanding of the nutritional risk factors in each region in order to develop effective, long-term strategies.

C. Health Deficiencies

The infant mortality rate in Mali, 173/1000, is among the highest in the world. Child mortality (zero to five years) has been reported to reach

350/1000 in some parts of the country. About 60 percent of all child deaths are attributable to four causes: measles, diarrheal disease, respiratory infections and malaria. Malnutrition exacerbates these diseases, and some of the diseases in turn contribute to poor nutrition. Yet all are preventable or treatable with simple methods, inexpensive vaccinations or medications.

Each year about 50,000 Malian children under the age of five die of the effects of diarrhea. Between 10 and 20 percent of these deaths, about 15 percent of the total, are the direct result of dehydration. Diarrhea results from unsanitary living conditions (e.g., lack of proper latrines), and from lack of potable water. But of greater significance is the lack of knowledge of oral rehydration therapy.

Measles is believed to account for over 7 percent of childhood deaths, with 80 percent of the mortality occurring in children aged one to five years. Whooping cough and neonatal tetanus account for large numbers of childhood deaths each year; in one region neonatal tetanus is responsible for 60 to 70 percent of deaths in children under one month of age. Immunization coverage rates are low, ranging from an estimated 1 to 7 percent for DPT-polio to about 15 percent for BCG.

Acute respiratory infections play a significant role in childhood mortality and morbidity rates. No effective approach has been formulated to deal with the problem in Mali, in part because of insufficient data on the scope of the problem, in part because of the lack of drugs used to treat such infections.

Malaria is the principal illness diagnosed by health centers in all parts of the country and is one of the leading causes of mortality in the under-five age group. Among pregnant women it is a major cause of low-birthweight infants. The majority of verified cases of malaria in Mali result from plasmodium falciparum. Chloroquine-resistant strains have not yet been

officially confirmed but because of the high incidence in neighboring countries, medical authorities suspect this strain will soon be evident. In the short term, the most effective malaria control strategy is presumptive treatment of fevers symptomatic of malaria with appropriate drugs (principally chloroquine). Again, these drugs are often unavailable in the villages.

AIDS poses a potentially devastating problem for Mali, as for other African countries. WHO recently provided the results of a nationwide surveillance study of seropositivity to the HIV 1 and HIV 2 viruses in Mali. A total of 1,515 people were tested. Nationally 30.72 percent of 482 prostitutes tested, 5.82 percent of 498 prisoners tested, and 3.79 percent of 532 pregnant women tested were seropositive to one or both HIV viruses. The results confirmed the presence of HIV 2 virus in all seven geographic regions of Mali and HIV 1 presence in all regions except Timbuctu. Follow-up actions are discussed in Section III.

The People's Pharmacy (PPM) is a parastatal organization with sole authority (exclusive of donor projects) to import medicines and distribute them through its 93 outlets and an estimated 450 private outlets. PPM is also supposed to distribute some medicines to public health facilities, but has generally been unable to do so for lack of MOH credits. The price of PPM drugs is 150 percent of the retail price in France, beyond the means of most Malians. Moreover, about half the sales occur in Bamako. Given the sparse network of pharmacies in rural areas, the population there depends heavily on traditional medicines from healers. Many donors have assisted the government in analyzing the pharmaceutical sector in Mali, with one multi-donor (IDA, A.I.D., EDF and FAC) study in the early 1980s resulting in a series of comprehensive structural, pricing, purchasing, and pharmaceutical policy changes. PPM has been operating at a profit, but problems of pricing, purchasing, quality control, management, and poor coordination between PPM and

the MOH have resulted in a continuing scarcity of medicines in Mali.

The MOH has many specialized offices at the central level responsible for developing policies and has developed a ten-year plan which outlines programs. However, service delivery is constrained by the Ministry's division into specialized components which suffer from organizational rivalries, confusion over responsibilities, unclear lines of authority, and a greater-than-usual need for coordination and information-sharing. Moreover, the government's financial, material and human resources are insufficient to provide more than a modicum of coverage in most areas, particularly outside urban centers. Few government health centers are able to incorporate vaccinations, ORT, growth monitoring or family planning activities into their regular service delivery. The result is that in many parts of the country health services are provided or supplemented by bilateral, multilateral or private voluntary organizations.

Sustainability of health care is a difficult issue in Mali. The MOH, aware of the need to begin self-financing, has recently established a policy to generate revenues through fees. Initial results from regional health centers indicate that facilities vary greatly in their ability to collect fees, revenues are insufficient to restock pharmaceuticals, and the impact of user fees for services may increase inequalities. For the foreseeable future at least, the GRM will not be able to meet the recurrent costs of a large child survival effort. The share of health in the national budget has declined from 6 percent in 1982 to 4 percent in 1987. Donors contribute approximately half of health investment funds. Primary health care, including preventive and community-based activities and the expenses of MOH divisions responsible for maternal/child health, immunizations, community development, epidemiology, and environmental sanitation, was marked for 13.2 percent of the 1986 and 1987 health budgets.

The Mission's program until 1985 sought to improve the delivery of primary health services at the village level through traditional birth attendants and village pharmacies. However, project studies showed that annual recurrent costs for a national village health worker program would consume about 15% of the GRM's budget.

Based on the lessons learned, the Mission changed its strategy in 1986 to provide health and family planning services through clinics and PVOs. Moreover, as part of the general geographic focus of the program, the Mission selected the densely populated rural and urban zones around Bamako in the Second Region as its principal health target area. This permits coordination with the Mission's agricultural program, allowing for health and agricultural activities to attack constraints to productivity jointly within the same population group. At the same time the Mission, other donors and PVOs are exploring strategies to ensure financial commitment to child survival activities, and testing delivery systems to find the most effective.

D. Population Pressures

Malian demographic statistics present a sobering picture for the country's development. If the population growth rate of 2.7 percent is not reduced, the population will double in 26 years, and the average annual GNP growth (1965-1983) of 1.2 percent will have to increase to 3 percent to prevent already low living standards from declining further.

The following statistics further highlight the parameters of the problem.

Table 1. Population Indicators

| <u>Indicator</u> | <u>Mali</u> | <u>U.S.</u> |
|--|-------------|-------------|
| Life Expectancy | 47 | 75 |
| Crude birth rate | 49/1000 | 16/1000 |
| Crude death rate | 21/1000 | 9/1000 |
| Maternal mortality | 17/1000 | .08/1000 |
| Fertility rate (children per woman of child-bearing age) | 6.7 | 1.8 |
| Percent of population under age 15 | 46 | 22 |
| Percent of population over age 64 | 2.7 | 12 |

These demographic figures are highly influenced by traditional practices and attitudes. Most women marry at age 16 and are exposed to pregnancy throughout their reproductive years. About 40 percent of married women are in polygamous unions where wives often compete for the husband's approval by having more children.

Children are highly valued in Mali for inheritance, social status and economic security. High infant and child mortality rates lead couples to have "extra" children as "insurance" and to provide an adequate supply of labor for the family. These constant childbearing obligations have confronted women with high risks of infection, undernourishment, and death in childbirth.

The high rates of maternal mortality and total fertility are undoubtedly related and point to the unmet need for family planning. The average birth interval reported in Mali is 2.5 years. Traditional birth spacing practices such as breast feeding and postpartum sexual abstinence are declining. Birth intervals therefore are likely to decrease further unless modern contraceptive use increases. The decline in traditional birth spacing practices is especially pronounced in urban areas where rural cultural values tend to break down. Recent severe droughts have accelerated urban migration, creating a particular need for family planning services in urban areas.

Women in Mali and elsewhere in Africa are increasingly cognizant of the

beneficial impact of birth spacing, and are looking for new ways to bring it about. A recent survey showed that 46 percent of Malian women interviewed throughout the country desired either no more children or greater birth spacing. However, only 17 percent of the women interviewed knew how to achieve this by means of either traditional medicinal plants or modern methods.

With the help of A.I.D.-funded population awareness-building, the GRM has moved toward acceptance and promotion of family planning as essential to its maternal/child health strategy and in recognition of the pressures which Mali's population growth rate will put on the country's land resources and national budget. The Mission is now building on this awareness to develop family planning institutions and service delivery in Mali.

E. Education and Training

The lack of basic and technical education opportunities for Mali's youth is a major constraint to development as a whole and to improving agricultural sector performance and family health specifically. The large majority of the population lives in the rural areas, where some 90 percent of the people lack basic literacy and numeracy. School enrollment increased after independence, but began regressing in the late 1970s for reasons cited below. Rates of enrollment at primary, secondary and higher levels dropped from 27.5 percent in 1980 to 21 percent by 1985, despite an increase in the number of schools and increased contributions from the national treasury and other donors.

In an effort to increase education effectiveness, the GRM in 1980 began pilot efforts at the primary level to teach in four principal national languages rather than French. Rural school curricula were changed to make them more appropriate for the respective areas, and parent/teacher associations were created to encourage self-help school construction using local materials. Despite these changes, enrollment rates are in decline and dropout rates are rising. The probable reasons are the reluctance of poor

parents in rural areas to send children to school because of the high costs of family and community contributions to schooling (over and above taxes), few prospects for enhanced employment opportunities after graduation, and the need for the children's labor on the farm where the economic returns are tangible.

Although absolute GRM budget outlays for education have been increasing, the percentage of the total budget spent on education has declined from 24 percent in 1980 to 17.3 percent in 1986 and 1987. Primary education receives the largest single share, 40.8 percent, of the education budget.

Mali receives considerable assistance in education, the World Bank being the largest contributor for primary and secondary education. Following completion of two sector loans from the Bank totaling \$15 million for construction, equipment, materials and training, the current loan, Education III, provides \$13 million in support of further sector reforms. An Education IV project, valued at \$25 million, is under design.

The United States, other Western donors, and Communist nations have provided large numbers of scholarships and training grants to Malian secondary and higher-level graduates as well as in-service technicians and professionals. This assistance serves both specific project and general training needs. It is a donor response to the fact that in Mali, as elsewhere in Africa, the staff, facilities and curricula for education and training in development subjects are very limited. To cite a few examples: Malian administrative and industrial training institutions are concentrated in Bamako, leaving training needs of regional industries largely unmet. The private sector apprentice system is narrowly focused on immediate tasks to be performed rather than at broader skills development. The GRM no longer guarantees a government job for all secondary and higher graduates, yet the schools have not yet adapted their curricula to the wider and more technical needs of private sector development.

III. STRATEGY

A. Mission Program Goal and Strategic Objectives

Based on the analysis in Section II of the development problems facing Mali, the Mission's program goal will be sustainable economic growth for Mali. This means an increased growth rate in association with continuation of strong export performance, restraint on import outlays, improvements in public finances and better incentives for private sector activity.

The primary target group of the program will be rural small farm families, with particular attention paid to women as a key factor in both agricultural production and mother-child health. Private entrepreneurs will constitute the Mission's secondary target group. We believe that assisting the private sector to provide more goods and productive services with greater efficiency will increase the rate of economic growth, promote employment and benefit the rural population.

As its program purpose, the Mission will pursue two interrelated strategic objectives:

1. More Efficient Resource Allocation

More efficient resource allocation will be sought between and within the public and private sectors. Improvements in the delivery and cost-effectiveness of services for which the public sector is the appropriate vehicle at this time (e.g., research, extension of agricultural technology, implementation of a market information system, etc.) will release some government resources for maintenance and expansion of the services, or for allocation to other priority uses. At the same time, divestiture by government agencies of activities suitable for private sector involvement will offer the opportunity to private entrepreneurs to fill the gaps, provided the efficiencies and financial benefits to be gained so warrant.

The program will promote policies to improve resource allocation at the macroeconomic level so as to complement U.S. technical and commodity assistance at the sectoral level in agriculture, nutrition, health and family planning. For example, the macroeconomic policy dialogue agenda, by dealing with the regulations governing financial markets, will aim at improving the availability of credit to small agricultural producers. Changes in regulations and tax and customs rates that enhance incentives for private entrepreneurs to supply production inputs may result in better, lower-cost access to production inputs for farmers. Both herders and veterinarians will benefit as restrictions on the private provision of veterinary pharmaceuticals and animal health care services are relaxed or eliminated.

2. Increased Production, Productivity and Incomes

This objective will be sought for rural households engaged in agriculture or related activities (e.g., marketing, processing and storage). Its attainment will contribute to better nutrition and food security at the household level. It will also contribute to increased national food security in that Mali will be in a better position to produce and purchase the food it needs. This approach is consistent with the President's End Hunger Initiative.

This objective will contribute to improving macroeconomic performance, i.e., to achieving, on a sustainable basis, a higher rate of overall economic growth. Sector activities and policy changes in agriculture and health that lead to improvements in the performance of producers, technicians, managers and institutions will contribute both to sectoral and overall productivity.

B. Explanation of Problem Selection

The Mission will pursue these objectives by addressing three interrelated problems during the 1990-94 CDSS period: slow economic growth, hunger and malnutrition, and mother/child health deficiencies.

1. Slow Economic Growth

The selection of slow economic growth as a key problem to address is based on Mali's negative (-1.5 percent p.a.) rate of per capita income growth over the period 1977-86, persistent trade deficits, and sharply rising debt service obligations which threaten to limit future growth prospects even further, given Mali's high dependency on grants and soft loans from external donors simply to help cover the persistent balance of payments shortfalls, apart from the country's need for donor investment in development.

Both macroeconomic policy deficiencies and sectoral problems constrain economic growth in Mali. A critical deficiency is statist economic policy. Although now partially reformed, thanks in part to A.I.D. efforts over the last five years, such policy still places unnecessary restrictions on the activities of private entrepreneurs, traders, low-income smallholder farmers, and credit institutions. If development is to have any chance in Mali, and if A.I.D. is to continue to participate in the process with any effectiveness, then it is essential that A.I.D. continue to participate in the multi-donor policy reform effort through the next CDSS period.

As shown in Section II, the principal sectoral constraints on economic growth in Mali are found in agriculture, which accounts for about half of GDP and employs some two-thirds of the population. Without improvements in agricultural productivity to generate exports and substitute for cereals imports, sustained growth of other sectors and the economy as a whole will not be possible. The potential for growth of Malian agriculture is substantial. The Mission has a long record of participation in the development of crop and livestock agriculture in Mali, and through the contributions made by U.S. technicians has gained credibility for continuing assistance to the sector. For these reasons -- great need, potential impact and credible experience -- the Mission will continue to address agriculture as a principal sectoral focus

for its efforts to promote economic growth in Mali.

2. Hunger and Malnutrition

By helping develop agriculture, the Mission seeks to break a vicious circle in which inadequate production and farm income contribute to hunger and malnutrition, which in turn reduce agricultural productivity. The problems of hunger and malnutrition, however, stem not only from inadequate food production but also from poor health, dietary preferences and restrictions which inhibit nutritional intake and/or absorption. The Mission will address these various aspects of the problem.

3. Health Deficiencies

The poor physical state of much of the population of Mali is brought on by a combination of malnutrition, hunger, lack of preventive measures, unsanitary conditions and, in the case of women of child-bearing age, social and economic pressures to have many children. The alarmingly high morbidity and mortality rates among children only add to the child-bearing and child-rearing burdens placed on women. Yet they are counted upon for a large proportion of agricultural activities including planting, harvesting, transport, processing and marketing. Hence considerable benefits can be derived from a coordinated effort to combat major childhood diseases and promote child spacing. Apart from contributing to basic well-being, success in such an effort can (a) directly increase productivity, particularly in food crop production, (b) serve gradually to reduce the population growth rate, and (c) thereby ultimately contribute to further growth of per capita productivity and income.

C. Program Consolidation

The Mission's selection of these problems for the next CDSS period is consistent with the prioritization and consolidation of its program over recent years. In the wake of the lengthy and disastrous drought of the early

1970s, USAID/Bamako, with AID/Washington encouragement, tried to tackle an array of problems that turned out to be too broad. Staff energies and Mission financial resources were dispersed across more activities than could be effectively managed, and the impact of U.S. assistance was hard to gauge. The reduction of the portfolio resulted in a manageable number of projects in the fields of agriculture, child survival/family planning, management and planning improvement, and economic policy reform. The essential change in the 1990-94 strategy is that mother/child health and nutrition issues will become a focal point. Training in management and planning, which has had a positive effect through the emphasis given it during the current CDSS period, will continue as a key component of human resources development throughout the program. Emergency assistance concerns are integrated into the broader program.

Another feature of the program that will be continued is its geographic focus, largely in Mali's Second Region. Here higher-than-average population densities and rainfall as well as better infrastructural support and communications make payoffs on investments more likely and cost-effective. Modest activities in the Fifth Region (natural resources management, biological diversity) will be undertaken, consistent with that region's importance in terms of natural resource problems and prospects and agricultural potential. In addition, as a measure of drought preparedness, minor drought-rehabilitation activities to support vulnerable groups in the Sixth and Seventh Regions will continue via PVOs.

D. Strategies for Addressing the Specific Problems Selected

To address the identified problems of slow economic growth, hunger and malnutrition, and health deficiencies over the next CDSS period, the Mission will use as appropriate range of A.I.D.'s approaches to development, i.e., policy dialogue, technology development and diffusion, development of human resources and institutions, and private sector development. Benchmarks of

progress toward attainment of strategy objectives are found in Annex 1.

1. Strategy for Promoting Economic Growth

a. Economic Restructuring and Policy Reform. A major obstacle to economic growth in Mali has been the state-led growth strategy and associated economic policies governing the country's development effort over much of the post-independence period. Since 1981 the USAID has been among the leading donors engaged in dialogue with the government to reform these policies. Dialogue topics have included abolition or revision of regulatory controls on commerce; tax reform to improve private sector incentives; institution of user fees to cover the recurrent costs of essential services; control of civil service rolls and the public payroll; market liberalization to offer private merchants legal access to the trade in cereals; and divestiture by government agencies of activities that the private sector can perform more efficiently. Concrete A.I.D. assistance to help introduce and implement the reforms has been rendered through the Economic Policy Reform Program, the Cereals Marketing Restructuring Project, the Operation Haute Vallee project and a number of research studies looking at constraints to private sector development and economic growth. The achievements resulting in part from this policy dialogue and related assistance have been summarized in the Overview and Analysis sections.

Although much has been achieved in the direction of a more open market, a reduced role for government, and correspondingly greater participation by the private sector, many policy impediments to growth remain. They require both sustained implementation of reforms already agreed to and underway, and further changes in policy.

To achieve the Mission's objectives of a more efficient allocation of resources and increased rural and agricultural production, productivity and incomes, the following topics will form the core of the USAID's policy

dialogue agenda.

(1) Privatization for more efficient service delivery. The Mission will seek further divestiture by government agencies of responsibilities for the delivery of goods or services better furnished by the private sector. We will follow through on assisting the GRM to implement key policy reforms in the restructuring of cereals marketing and regional development organizations (ODRs) begun during the 1985-89 CDSS period. This assistance will include monitoring implementation of the projected agreement to divest the Haute Vallee extension agency in the Second Region of responsibility for agricultural credit, input supply, and crop marketing services in its territory. In coordination with other donors contributing to the health, family planning and livestock sectors, the Mission will examine the possibility of conditioning assistance on evidence of effective movement toward privatization of selected health and veterinary services.

(2) Improvements in financial markets. Field work for a Mission-sponsored study of financial markets was completed in March 1988. This has pointed the Mission toward dialogue with the government on consideration of more flexible credit ceilings for the banks that will participate -- with A.I.D. support -- in offering credit to rural producer groups. The study also points to the following possibilities:

- working with commercial banks to expand lending to small farmers and businesspeople who have proved to be good credit risks in A.I.D.-funded credit programs;
- providing partial guarantees of bank credit to new clients for small business loans;
- providing training to bank personnel and potential clients in project preparation and appraisal and in business management; and
- promoting linkages between banks and informal sector credit groups in order to give small entrepreneurs access to bank credit and to improve the economy's savings mobilization performance.

A strategy based on the above study will be put in final form before the

start of the new CDSS period.

(3) Government personnel and budgetary management. Although civil service rolls generally have been placed under severe growth limitations, we foresee continued monitoring and dialogue to ensure that government personnel levels and corresponding wage outlays remain in line with essential needs and budgetary limits. In the case of personnel employed in agricultural development activities such as the Haute Vallee where the Mission provides assistance, the Mission foresees the need for reductions as part of the process of divesting functions to the private sector.

(4) Regulatory and licensing controls. We will seek further reform of government regulations and controls, and implementation of the reforms, so as to encourage greater and more efficient private sector economic activity, including the import and export of items now handled by government agencies. Agricultural production inputs, pharmaceuticals and veterinary medicines are examples of commodities that would be more efficiently imported and distributed by the private sector. Lessening of the restrictions now in effect may provide incentives for new business start-ups.

(5) Tax and customs rates. The Mission will promote further reduction of customs and tax rates that discourage and distort private sector activity and impede USAID project interventions.

(6) User or service fees for cost recovery. Mali's fiscal problems limit the scope for government provision of free services. Hence, where it remains appropriate for the government to continue to provide services, or where the private sector sees little benefit to be derived from participation, we will examine the possibility of charging user fees; if deemed feasible, we will promote their introduction through policy dialogue. The health sector and livestock subsector of agriculture are candidates for such consideration.

b. Improving Agricultural Sector Performance. The policy reforms cited above will have their greatest impact on increasing agricultural production and growth linkages if complemented by and coordinated with technical and institutional interventions to enable and motivate private sector operators to provide a wider range of goods and services with greater efficiency in rural areas and farmers to increase production. Our activities to improve agricultural performance will be tailored to the resource and labor endowments of specific groups including women and poor farmers. Our efforts will focus on the following critical areas: cereals market restructuring, rainfed food-crop production, crop technology transfer, livestock development and natural resources management and biological diversity.

(1) Cereals market restructuring. This has been a major subject of policy dialogue during the current CDSS period, and significant policy reforms have been agreed to, as discussed above. To implement the reforms at the field level, however, we will encourage institutional changes which, together with better road infrastructure, will improve incentives for increased production by reducing market-related risks to smallholders and other members of the private sector. We will provide support for more active participation of village organizations and private traders in grain storage and marketing, a more effective and extensive credit delivery system for both groups, and a market information system. Such developments can stimulate the creation of new small and micro-enterprises and additional sources of income and demand for farm products. We will work in concert with the multi-donor cereals policy reform program.

(2) Rainfed crop technology development. Building on our ten years' investment in agricultural research, and on the research and infrastructure achievements to date, we will continue to develop technologies to increase land and labor productivity in rainfed food production (in

particular, sorghum and millet) for the more productive areas of the country. We will seek improved drought- and pest-resistance, soil water management, and productivity-enhancing varieties and agronomic practices. The base already established for on-station and on-farm research (where we are one of the two major donors) and extension-research links will be strengthened. Building on this base, and on our own experience and credibility in these areas, we will cooperate with the GRM, the World Bank and the International Service for National Agricultural Research (ISNAR) in planning and implementing a reorganization of agricultural research. The purpose will be to improve the selection of priority problems, increase efficiency, and speed the rate of technology development and testing. The results should encourage other donors to increase their assistance to Malian agricultural research.

(3) Crop technology transfer. We will encourage more effective private and public provision of technology (information, inputs, varieties) to farmers. Progress already made in developing extension methods and in privatizing technology transfer functions will be expanded and complemented by a devolution of many related marketing and credit functions from GRM parastatals to private village cooperatives. The remaining major inefficiency in agricultural extension in Mali is the current structure of separate regional extension organizations which receive little guidance or technical input from the top and have little contact with one another for exchange of experiences and ideas. We will use our accomplishments in effective technology transfer and privatization of technology transfer functions as a base from which to engage the GRM in dialogue on the issue of national extension organization in order to help overcome these inefficiencies and reduce overhead and personnel costs in extension.

(4) Livestock development. Support to animal health technology development and dissemination will be continued to improve disease diagnostic

capacity, applied disease research, vaccine quality control, and more cost-effective delivery of animal health services. We will build on recent GRM privatization decisions in the livestock sector to assist in privatization of some health delivery functions. Animal production technology will be further developed and extended to improve animal nutrition, the integration of forage into crop and livestock production systems, and the integration of livestock into crop production systems, in sustainable ways which increase crop yields and animal production while maintaining the natural resource base. Program effectiveness, animal productivity, and livestock/natural resources interactions will be closely monitored. Policies which constrain continued efficient, private sector-based livestock development will be identified and addressed.

(5) Natural resources management (NRM) and biological diversity. Techniques to improve agro-forestry, reduce fuelwood consumption, prevent soil erosion, and reverse the degradation of resources and the decline of biological diversity will be developed, tested and extended through both our crop and livestock research and extension activities and those activities devoted strictly to natural resources management. In addition, we will seek to engage the GRM in policy dialogue on the relative rights and responsibilities of government, local communities and individuals with regard to land, tree and resource tenure. The aim will be to bring about institutional and policy change to create greater incentives for private, as opposed to government, management of natural resources, as appropriate. Although we are a minor donor in this area, our analytical resources and experience based on pilot activities, as well as our incorporation of NRM into agricultural activities, may give us an important role in such a dialogue.

An analysis of the actions necessary to conserve biological diversity and maintain tropical forests and the Mission strategy for promotion of the same

will be developed and submitted for AID/W approval before the beginning of the new CDSS period. Annex 2 presents the Mission's current thinking on the subject.

2. Strategy to Promote Health, Family Planning and Nutrition

This strategy focuses on child survival, women's health, nutrition and control of AIDS. Based on the analysis above, the Mission considers these to be the key areas in which health, family planning and nutrition assistance can contribute to the well-being, productivity and food security of the majority of Malians.

The major geographic focus of our health and family planning activities will continue to be in the heavily-populated Second Region, also the center of most of the Mission's agricultural assistance. This overlap allows for an integrated, intersectoral approach that should enhance the impact of each program component. However, we will consider supporting selected PVO health programs in other geographic regions of the country as well as the capacity of the MOH to apply new health technologies which are being developed.

Evaluations of the above health and family planning activities will guide the Mission in determining ways to extend the outreach still farther into rural areas and in adjusting the activities as necessary. The Mission will use the services of the Peace Corps and centrally-organized projects and will cooperate closely with WHO, UNICEF and other donors on each of the problems selected and interventions described. We also plan to seek a full-time Technical Advisor for Child Survival (TACS) through the Center for Disease Control.

a. Health and Family Planning Interventions. The Mission plans to support the following interventions to address the problems of child survival, women's health and AIDS: oral rehydration, immunization against major childhood diseases, birth spacing including social marketing and

community-based distribution of contraceptives (CBD), nutritional surveillance, and support for preventive measures against AIDS. In support of these efforts we will finance, as appropriate in each case, management and policy reform, infrastructure and logistics support including establishment of model programs, training, community outreach programs, social marketing, operations research, and statistical and survey assistance. Assuring family planning services through the private sector Malian Association for the Promotion and Protection of the Family (AMPPF) will be a priority.

A brief description follows of specific types of intervention now underway and planned for the CDSS period:

(1) Management. The Mission will address organizational constraints found in the Ministry of Health, seeking to help (a) clarify responsibility for services, (b) strengthen central management, and (c) promote decentralization of services, particularly to under-served rural areas. We will also study means to ensure long-term financial commitment to project-sponsored health activities, and to reduce the cost and ensure the wider distribution of essential pharmaceuticals. These topics will form the basis for policy dialogue with the GRM, if possible in conjunction with other donors so as to maximize chances for positive results.

(2) Immunization. Currently bilateral donors and PVOs carry out most immunization activities. The GRM has formulated a comprehensive immunization policy and has received commitments of about \$8 million in donor assistance primarily through UNICEF, WHO and UNDP. The Mission will ensure that there is a complete immunization component (diphtheria, whooping cough, tetanus, measles and polio for children and tetanus toxoid for pregnant women) in all of the bilateral and PVO health projects that we support, but we will not duplicate assistance provided by other donors.

(3) Oral rehydration therapy. Oral rehydration therapy is a

simple and cheap technology which can be used nationwide in every setting to prevent infant deaths. In January 1988, the MOH formally initiated a national diarrheal disease control program which had been under development for two years. The Mission will continue to support this intervention through assistance for educational activities, launching of in-country production of oral rehydration solution (ORS) packets, studies including a health facility survey, a household survey, focus-group research on diarrhea-related nutrition issues, ORS distribution, training of health workers and case management.

(4) Respiratory infections. USAID will help the government document the scope of the problem and recommend alternative strategies for dealing with it. WHO has developed a set of criteria for diagnosis and treatment at the village level which could form the basis for a long-term strategy.

(5) Malaria. Provision of antimalarials for presumptive treatment of fevers in children appears to be the only possible intervention at the present time. The Mission policy dialogue on allowing private import of pharmaceuticals will be aimed at reducing the price of antimalarials and increasing their availability to patients.

The Mission also plans to sponsor operations research on ways to reduce the risks of malaria to both children and pregnant women. USAID will consider a proposal from WHO and the National Academy of Sciences to work with the Mali National School of Medicine in testing a new technology involving genetic manipulation of the female anopheles mosquito to inhibit its ability to act as a disease vector. Given the worldwide application of this research, S&T will be consulted and if the activity is deemed useful they will be requested to provide central funding.

(6) Family planning. A.I.D. is the principal donor concerned with population in Mali. Current assistance, planned for continuation into

the new CDSS period, involves upgrading clinics of the MOH, management and commodity support to the AMPPF to provide family planning services; and a number of centrally funded activities in the areas of information and education, training, voluntary surgical contraception, and operations research. The Mission plans a new project which will make a major effort to expand family planning services to the communities by means of social marketing and community-based distribution. We will also provide assistance on contraceptive inventory management, and an updated RAPID-type analysis of the impact of population growth on Mali's development as a means to strengthen the GRM commitment to family planning.

(7) AIDS. The GRM set up an AIDS Coordination Committee in late 1987 and with WHO assistance has developed a short-term plan that will assess the epidemiology of AIDS in Mali, set up a national structure to control the epidemic, and seek to reduce the rate of transmission through blood products, sexual contact and medical equipment. WHO is working with the AIDS Committee to develop longer-range plans. The Mission will urge the GRM and WHO to strengthen the committee by involving other ministries (Plan, Education and Defense) besides MOH. USAID, which is providing condoms in 1988 through central funding, will seek funds in the future for further assistance, as appropriate, under the WHO umbrella.

b. Nutrition Interventions. As part of our health strategy and concurrently with our efforts to reduce hunger and malnutrition through the growth of agriculture, we will carry out a series of activities aimed at the non-economic constraints to adequate nutrition described in Section II. Nutrition already forms part of the Mission's health program.

The primary non-economic nutritional problems identified in Mali involve infants and women. These problems include inappropriate food intake by pregnant and lactating women and children at weaning age, decline of

breastfeeding in urban areas, and inappropriate and inadequate food intake by children during diarrheal episodes. These three problems contribute to the high rates of infant and maternal mortality seen in Mali. The Mission plans to address these problems as follows:

(1) Special studies. The Mission will fund special studies on improving information concerning dietary preferences and local availability of nutritious foods in Malian villages. The results of these studies will enable the Mission to devise a strategy to address the nutritional problems noted the Section II.

(2) Management. As noted in Section II, the Nutrition Service, a component of the MOH, is the implementing agency for health-related nutritional activities. USAID will examine ways to help the Nutrition Service strengthen its organizational staff, data-handling and outreach capabilities, and coordinate its efforts with other divisions of the MOH and with other concerned government agencies, particularly those involved in agricultural extension. Inasmuch as the Mission is one of several donors engaged in Mali's nutrition/health sector, we will seek other-donor cooperation in this effort, which is likely to comprise a combination of analyses, policy dialogue, and implementation assistance.

(3) Social marketing. The Mission plans to help the Nutrition Service in social marketing and public health communication research. Communication campaigns will be conducted to promote improved nutritional practices such as maintenance of breastfeeding, supply of protein and calorie-rich weaning foods for infants, increased intake of protein, calorie- and iron-rich foods by pregnant and lactating women, and non-withdrawal of fluids and food during infant diarrheal episodes. This national campaign will be evaluated following inception to determine if messages are reaching the target audience (primarily mothers), if the messages are understood, and if

the messages result in behavior modification. The ultimate goal will be improved nutritional status of mothers and infants and presumably a resulting reduction in infant and maternal mortality and morbidity.

(4) Nutritional surveillance. Malnourished children and their parents must be identified if they are to receive help in the form of temporary supplementary feeding and nutritional education for their family providers. The nutritional surveillance strategy of monitoring children's growth using anthropometric measurements is being used by both the MOH and PVOs. The Mission will continue to provide support for these activities in the Second Region and at selected PVO sites in other regions. We will also support the collection of information on the effect of these interventions over time to better focus assistance efforts for the most at-risk population.

E. Program Support Strategies

1. Training Support Strategy

The Mission's training support activities are closely related to program needs rather than to the education sector in Mali. Historically, the Mission has not been involved in assisting Malian education and literacy training on a broad scale, and lacks the resources to do so. As noted in Section II, the World Bank and France are heavily engaged in the development of education in Mali.

What the Mission can do is (a) continue its basic literacy and numeracy training of people in the Haute Vallee project area, (b) strive to communicate agricultural and health education themes in such a way that illiterate project beneficiaries can understand them, and (c) continue to train Malian private and public technicians and professionals within given bilateral programs and projects and through Africa Bureau regional training support mechanisms. The latter includes the AFGRAD program, under which the Mission will continue to provide a few Malians each year with fellowships for training essential to

Mali's development but not necessarily linked to Mission projects.

As in the past, cost-effectiveness will be a major consideration in operating the Mission's training program. Where possible, technicians on the ground or brought in for short terms will provide training in-country, often for sizable groups of Malians. Where necessary, Malians will be sent to the United States or third countries for specialized training.

The above strategy discussions reflect the areas in which we will provide training during the 1990-94 period. In addition, the Mission will pursue the following special training themes.

Management and organizational improvement. This has been a special cross-sectoral theme of the Mali program. It includes general management training, furnished under HRD umbrella projects; and on-the-job and specialized training in planning and management within specific projects. External evaluations and IG reports have confirmed that management improvement work has had major impact on program and financial administration in the Mission's crop and livestock portfolio. Although such improvement will no longer be listed as a major strategic objective as it was in the last CDSS, it nevertheless will continue to receive priority attention.

Women in development. Training of women is indispensable to the achievement of our strategic objectives. The Mission and GRM have made special efforts to include women in U.S. long-term training programs, but the number placed has shown only a slight increase. Social and cultural conditions appear to inhibit women from leaving their families for training abroad. Few women have Bachelors degrees to take advantage of graduate training opportunities, particularly in agriculture. The Mission will continue to seek out qualified women candidates for U.S. training, and will give priority to arranging in-country or short-term regional training for women involved in the above-listed programs.

Private sector development. In providing in-country business-related seminars and workshops, the Mission will focus on the following target groups and subjects: (a) special training for existing entrepreneurs who wish to diversify or expand their businesses; (b) basic business training for new entrepreneurs; (c) management and literacy/numeracy training for village cooperative leaders and office-holders; and (d) sensitization training for government officials with whom entrepreneurs must deal in order to start and operate businesses.

2. Strategy for Emergency Preparedness

Donor and country planning for recurrent droughts, low rainfall periods and other emergencies should seek to improve institutions and programs to deal with these problems on a long-term, orderly basis rather than a crash basis. Mali is likely to experience one or two droughts during the next five years. In addition, there is a strong possibility of other emergencies such as grasshoppers, locusts, yellow fever and cholera. It is critical that the Mission maintain a capacity for an early response to such events.

USAID/Mali has a fine track record in responding to emergency assistance needs through its disaster relief plan, an advisory body (DRAG) that monitors drought and other emergencies, a Drought Relief Office which manages day-to-day food-aid programs, experienced USDH and FSN staff, and excellent relationships with the PVO community.

Maintaining a capacity for early response will require:

- continuation of the multi-donor Systeme Alerte Precoce (SAP), the A.I.D. Famine Early Warning System (FEWS) and participation of our Drought Relief Officer in deliberations of the GRM;
- crop assessments and food needs analyses completed each October;
- provisions for immediate funding assistance (OFDA, PD&S set-aside) after the Mission detects signals of a drought or other emergency; and
- programs that will maintain PVO presence in Mali to deliver assistance in the case of inevitable drought.

In addition, A.I.D., with other donors and the GRM, will examine internal operations and coordination mechanisms to ensure that all possible long-term preparedness measures are being taken, e.g., establishment of sufficient storage capacity in likely areas of need, and awareness-building of all GRM and donor personnel concerned so that they will take appropriate actions in their spheres of responsibility the moment signs of trouble appear.

IV. RESOURCES AND OTHER DONORS

A. Other Donors

1. Trends in Official Development Assistance (ODA)

ODA commitments in Mali totalled nearly \$1.86 billion in the years 1981-85, representing an increase of about 15 percent over the four-year period immediately preceding. One measure of the increase in ODA was the growth in bilateral aid, particularly from the United States and Italy. The year 1984 was characterized by an unprecedented rise in aid from the U.S. in the form of food aid but also in project and program funding. Since 1981, the consistent growth in assistance from the Netherlands and also from Japan is noteworthy. On the other hand, assistance from Germany has declined as commitments for the Manantali Dam have decreased. The sharp rise in OPEC aid was essentially related to the regional village water supply program financed by Saudi Arabia. Mali received just over 15 percent of the total aid given to Sahel countries during the period 1975-1984, more than any other Sahelian country. For the period 1980-1984, Mali fell to second place behind Senegal in this dubious category. Per capita disbursements for Mali, along the lines of other Sahelian countries, is considerably above per capita disbursements for other sub-Saharan African countries and substantially above those for Asia.

The OECD countries contributed over half of all ODA to Mali; multilateral

financial institutions (EEC, IDA, UNDP and others) contributed over 25 percent, and OPEC countries and financial institutions contributed 20 percent. Some 40 donors are funding development in Mali in widely differing proportions. Table 2 lists the major donor group and their percentage of ODA for the years 1981/86. Presumably, the relative percentages would remain the same over the five-year period of the next Development Plan.

2. Trend in ODA Disbursements

While donor commitments have risen steadily over the same five years (the commitments represented only about 75 percent of the projected need as outlined in the GRI planning document for the 1981-85 period), the trend in net disbursements is down with the exception of 1984, a year of substantial food aid imports. Only about \$1.18 billion was disbursed over this period. Several factors are responsible for the widening gap between commitments and disbursements:

- donor technical and administrative requirements are cumbersome;
- economic reform conditionality is difficult to negotiate and implement;
- the increase in the number of activities has increased work load;
- inability to service debt affects disbursements on other projects (non-payment of service on Selingue Dam debt caused temporary suspension of Manantali Dam disbursements);
- donors, skeptical of results of past investments, delay disbursements;
- donor agencies are, themselves, having budgetary problems.

3. Sectoral Orientations of Development Investments

Sectoral orientations of ODA are difficult to break out because of imprecision of statistics on attributions of commitments and disbursements to separate components of "integrated rural development" projects. Non-project assistance, which is utilized more and more in Mali, also precludes targeting financing to a specific sector. Non-project assistance, including food aid, has been increasing as a percentage of total ODA and now constitutes over 35 percent of total ODA to Mali. Food aid has increased four times as fast as total aid since 1980. In fact, the 1981-85 investment plan was substantially

Table 2

DONOR DEVELOPMENT ASSISTANCE
(In Millions of Dollars)

09-Apr-88

| DONORS | 1981-85 Total | 1981-85 as % | 1985 Total | 1985 as % | 1986 Total | 1986 as % |
|------------------------|------------------|-----------------|---------------|--------------|---------------|--------------|
| Total | 1,866.0 | 100.0% | 395.8 | 100.0% | 455.5 | 100.0% |
| Bilateral | 1135.6 | 60.9% | 242.7 | 61.3% | 258.3 | 56.7% |
| France (FAC/CCCE) | 143.1 | 23.7% | 37.7 | 9.5% | 68.5 | 15.0% |
| FRG (GTZ/KFW) | 133.9 | 7.2% | 18.4 | 4.6% | 17.9 | 3.9% |
| Canada | 133.9 | 7.2% | 20.5 | 5.2% | 22.7 | 5.0% |
| China | 28.1 | 1.5% | 7.1 | 1.8% | 6.8 | 1.5% |
| Netherlands | 45.5 | 2.4% | 20.1 | 5.1% | 33 | 7.2% |
| Italy | 22.6 | 1.2% | 14.8 | 3.7% | 9.7 | 2.1% |
| Switzerland | 45.5 | 2.4% | 6.5 | 1.6% | 10.5 | 2.3% |
| U.S.A. | 143.8 | 7.7% | 46.4 | 11.7% | 28.5 | 6.3% |
| Kuwaiti Fund | 45.5 | 2.4% | 10.6 | 2.7% | 5.3 | 1.2% |
| Japan | - | - | 8.1 | 2.0% | 6.9 | 1.5% |
| Saudi Fund | 68.9 | 3.7% | 12.1 | 3.1% | 9 | 2.0% |
| United Arab Emirates | 24.8 | 1.3% | 16.5 | 4.2% | 18.1 | 4.0% |
| Other | | 0.0% | 23.9 | 6.0% | 21.4 | 4.7% |
| Multilateral | 730.4 | 39.1% | 153.1 | 38.7% | 197.2 | 43.3% |
| EB | 187.3 | 10.0% | 29.5 | 7.5% | 37.2 | 8.2% |
| BAD/EAD | 91.1 | 4.9% | 9.6 | 2.4% | 18.4 | 4.0% |
| IMF | 100.7 | 5.4% | 13.2 | 3.3% | 11.5 | 2.5% |
| UNDP | 56.9 | 3.0% | 8.5 | 2.1% | 11.2 | 2.5% |
| UN Agencies (not UNDP) | 148 | 7.9% | 67.5 | 17.1% | 78.1 | 17.1% |
| World Bank | 146.4 | 7.8% | 24.8 | 6.3% | 40.8 | 9.0% |

Source: Répertoire National des Projets (RNP)
Ministère du Plan - Direction Nationale de la Planification
Projet PNUD/DIICD "Assistance à la Planification"

changed by donor orientations since the GRM contribution to the realization of the plan was limited to about 13 percent of total financing. Donor investments in the secondary sector, particularly in water delivery, mining and industry, allowed the planning target to be exceeded in this sector while other sector targets were not met. Table 3 lists the percentage of resources (GRM and ODA) going to the various sectors. The data show several things of interest:

- though 90 percent of the food produced in Mali is from rainfed agriculture, only 4 percent of the development assistance is allotted to rainfed food production. Approximately 13 percent of total aid is earmarked for irrigated agriculture (this includes investments for the Manantali dam);
- although livestock is the single most important export, only 2.5 percent of total aid is devoted to this sector;
- aid for ecology and forestry represented 1.5 to 2 percent of the total. While this sector received a sharp increase in the years 1977-1980, since 1981, aid commitments to the ecology-forestry sector have continued to decline.

B. U.S. Resources

1. The Program Portfolio

Over the past four years, the Mission has achieved financial discipline and sound implementation management in the portfolio and a concentration of resources on policy reform, food security and management objectives. A radical portfolio consolidation was undertaken to go from 17 bilateral projects in 1983 to seven principal projects in 1987. The exercise is continuing. The Manantali Resettlement Project, the last major project which is not in direct response to Mission objectives, will be completed by its scheduled PACD of Sept. 30, 1989. The Development Leadership Training Project will terminate within the next 18 months and, given the outlook for OYB levels, will not be continued as a discrete project. No new sector efforts are planned. While further, marginal portfolio refinement can be done over the coming years, the portfolio responds favorably to Malian needs and to a limited, realistic set of Mission objectives.

TABLE 3

Allocation of Resources
All Donors

| | 1985 | as % | 1986 | as % |
|---------------------------------|-------|--------|-------|--------|
| TOTAL | 320.1 | 100.0% | 411.1 | 100.0% |
| Planning, Management, Policy | 8.0 | 2.5% | 16.5 | 4.0% |
| Natural Resources | 74.1 | 23.1% | 82.4 | 20.0% |
| Agriculture, Forests, Fisheries | 65.0 | 20.3% | 107.1 | 26.1% |
| Industry | 21.5 | 6.7% | 16.5 | 4.0% |
| Transport, Communication | 10.0 | 3.1% | 45.7 | 11.1% |
| Health, Population | 10.2 | 3.2% | 20.8 | 5.1% |
| Human Resources | 4.5 | 1.4% | 10.0 | 2.4% |
| Education | 16.6 | 5.2% | 21.1 | 5.1% |
| Humanitarian Asstce | 81.5 | 25.5% | 44.0 | 10.7% |
| Other | 28.7 | 9.0% | 47.0 | 11.4% |

Source: UNDP Annual Report on ODA

2. Allocation of Resources

The CDSS strategy is predicated on a funding level of approximately \$12 million in DA funding per year, or \$1 million less than the amount received in FY 1988. (An extraordinary allotment of \$6.125 in FY 1988 was for the Economic Policy Reform Program). The strategy anticipates that follow-on EPRP programs will be absorbed by the OYB. Rice imports under PL-480 Food for Development Section 206 will continue to be an important vehicle for resource transfer and policy reform over the next four years in support of our participation in the multi-donor Cereals Market Restructuring Project. Rice production remains structurally in deficit and the U.S. imports will fall easily within the usual marketing requirements guidelines. Relatively small quantities of Title II foods for PVO nutrition and food-for-work programs will continue, particularly in deficit-production and drought-prone regions of the country. A major drought would, of course, change this scenario and necessitate emergency food imports. Opportunities for increased monetization of food for development purposes are limited but are being explored. Local currency remaining in the counterpart fund created during the height of the 1983-84 drought to transport emergency food is still being used for this purpose. Negotiations are under way to extend the use of this fund to support PVOs and village-based organizations to support Mission strategy in a manner consistent with PL-480 legislation.

Central Bureau resources constituted an important element of the program in the past. However, general budget reductions will probably result in the Mission having less direct access to Central Bureau resources. Recent decisions to allocate funds to the field for "buy-ins" to regional projects will also mean a more rigorous screening of regional projects and our buying-in only to those regional projects which are important to and supportive of the Mission strategy.

The allocation of resources, by percentage of total funds available to the program over the past five years and for the five years of the CDSS, per sector/sub-sector, are presented on Table 4 and Graph 1. These illustrate that the dedication of funds to economic policy reform, which began in 1984/85 with the PRMC and EPRP programs, continues through the period of the CDSS.

A review of the pipeline and mortgage situations (Table 5) indicates that these are manageable and well within AID guidelines.

3. Management Capabilities and Alternatives

Internal inflation resulting in higher local costs and the devaluation of the U.S. dollar against the CFA franc has placed the Mission's ability to carry out the development program in Mali in an increasingly difficult position. With the general Federal deficit in the U.S. and continual pressure to hold operating expenses at a constant level, we run the risk of letting the allocation of operating expense resources become the driving factor in program planning and implementation. The principal management concern of the Mission, then, is to maintain acceptable levels of financial and implementation vulnerability while carrying on a policy dialogue and managing the portfolio of projects even as we are faced with straightlined or reduced OE levels.

The Mission's management strategy is based on steps already taken to limit the sectors of investment and the number of projects in the portfolio, and to develop a core of well-qualified Malian technicians and project managers. The present USDH ceiling is 18. Even with an immediate reduction in the USDH ceiling by several people, the program can be implemented within acceptable levels of vulnerability. If the present program for the recruitment and training of FSN staff Malians continues, further cuts in the out-years can be envisaged. The staff mix, USDH, FSN and contract, has changed over the past several years to reflect the emphasis given to policy reform, private sector and hunger questions. The Program Office has been

Table 4

Allocation of AID Resources
Attributions to CDSS Strategy Elements

09-Apr-88

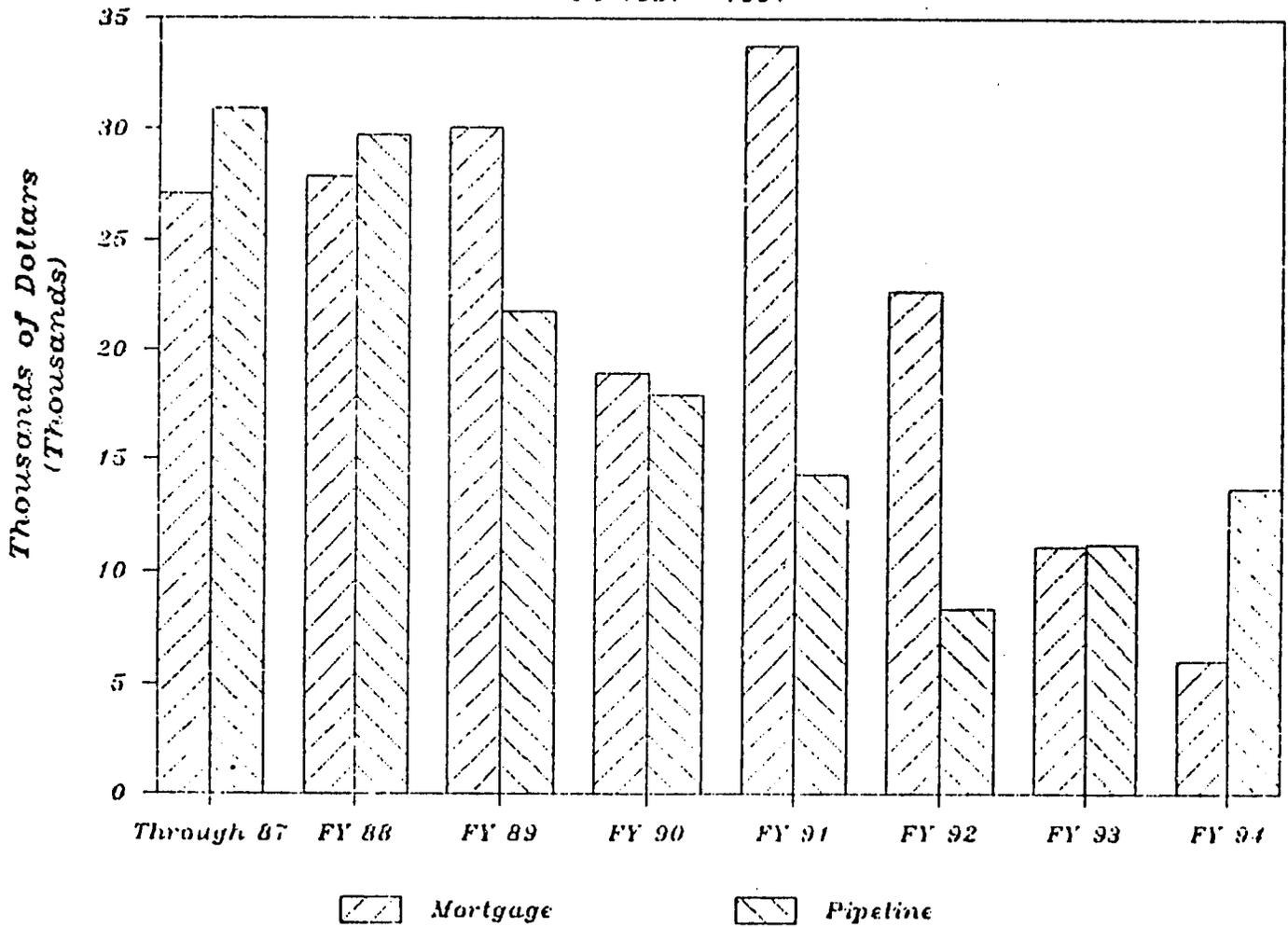
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Program Total (OYB, PU480, ESF) | 27,711 | 31,441 | 15,292 | 12,366 | 28,171 | 20,660 | 21,500 | 21,850 | 14,500 | 14,500 | 14,500 |
| Economic Restructuring and Policy Reform | 1,399 | 18,000 | 7,000 | 5,566 | 15,585 | 9,305 | 10,500 | 9,165 | 3,055 | 500 | 5,897 |
| 688-0221 Devt Leadership Training | 1,399 | 0 | 0 | 4,566 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0233 DHV (Credit component) | 0 | 0 | 0 | 0 | 1,660 | 1,455 | 1,500 | 1,315 | 555 | 0 | 0 |
| 688-0240 EPRP | 0 | 18,000 | 0 | 0 | 6,525 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0241 PRMC and Section 206 | 0 | 0 | 7,000 | 1,000 | 7,400 | 7,000 | 7,000 | 7,000 | 0 | 0 | 0 |
| PROPOSED EPRP II | 0 | 0 | 0 | 0 | 0 | 500 | 2,000 | 500 | 2,500 | 500 | 2,000 |
| 688-0248 Private Sector Expansion | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,397 |
| PROPOSED Rural Private Sector (L/C) | 0 | 0 | 0 | 0 | 0 | 350 | 0 | 350 | 0 | 0 | 0 |
| Hunger | 9,760 | 10,060 | 7,752 | 3,600 | 7,500 | 5,985 | 4,780 | 5,815 | 5,975 | 8,130 | 5,133 |
| 688-0205 Land Use Inventory | 270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0207 Ag. Officers' Training | 480 | 2,100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0210 OHV | 1,600 | 1,400 | 1,482 | 1,600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0218 Livestock Sector II | 6,000 | 0 | 2,550 | 0 | 4,000 | 1,000 | 0 | 0 | 0 | 0 | 0 |
| 688-0225 Semi-Arid Tropics Research II | 910 | 0 | 2,000 | 2,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0232 Farming Systems Research | 0 | 6,560 | 1,720 | 0 | 0 | 3,230 | 3,280 | 2,000 | 2,700 | 0 | 0 |
| 688-0233 DHV (Extension and Planning) | 0 | 0 | 0 | 0 | 2,000 | 1,455 | 1,500 | 1,315 | 555 | 0 | 0 |
| 688-0934 Activites Paysannes | 500 | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 0 | 0 | 0 |
| 688-0937 Village Reforestation | 0 | 0 | 0 | 0 | 1,500 | 0 | 0 | 0 | 0 | 0 | 0 |
| PROPOSED Agriculture Research Support | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,100 | 0 | 1,490 | 770 |
| PROPOSED Livestock III | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 1,552 | 4,233 | 4,363 |
| PROPOSED Semi-Arid Tropics Research III | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 900 | 1,168 | 2,407 | 0 |
| Health Deficiencies | 0 | 1,200 | 0 | 2,450 | 3,676 | 4,000 | 5,350 | 6,500 | 4,500 | 5,500 | 2,500 |
| 688-0227 IFAHS | 0 | 1,200 | 0 | 2,450 | 0 | 500 | 1,850 | 2,000 | 0 | 0 | 0 |
| PROPOSED NGO Support | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 | 2,000 | 3,000 | 0 |
| PROPOSED Africare Segou CS project | 0 | 0 | 0 | 0 | 755 | 0 | 0 | 0 | 0 | 0 | 0 |
| PROPOSED Population New Start | 0 | 0 | 0 | 0 | 0 | 1,000 | 1,000 | 1,000 | 0 | 0 | 0 |
| PL 480 PVO Title II | 0 | 0 | 0 | 0 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| VARIOUS PVO Title II | 0 | 0 | 0 | 0 | 421 | 0 | 9 | 0 | 0 | 0 | 0 |
| Emergency Food Transport (L/C) | 0 | 25 | 1575 | 184 | 750 | 300 | 300 | 0 | 0 | 0 | 0 |
| 698-0421 ACSI/CCCD (for PRITECH) | 0 | 0 | 0 | 0 | 375 | 0 | 0 | 0 | 0 | 0 | 0 |
| Multisector | 16,552 | 2,181 | 540 | 750 | 1,410 | 1,370 | 870 | 370 | 970 | 370 | 970 |
| 688-XXXX VITA Woodstoves | 0 | 358 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-0234 Small Project Assistance | 40 | 0 | 40 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 |
| 688-BUGS Grasshopper Control | 0 | 0 | 500 | 450 | 0 | 500 | 0 | 0 | 0 | 0 | 0 |
| 688-0510 PD and S | 0 | 0 | 0 | 0 | 370 | 370 | 370 | 370 | 370 | 370 | 370 |
| 698-0455 AFGRAD III | 0 | 0 | 0 | 0 | 180 | 100 | 100 | 0 | 100 | 0 | 100 |
| 698-0463 HRDA | 0 | 0 | 0 | 0 | 820 | 490 | 400 | 0 | 500 | 0 | 500 |
| 625-0955 Madantali Resettlement | 16,512 | 1,823 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Allocation of AID Resources

| | 1984-89 | 1990-94 | Total |
|--|---------|---------|--------|
| TOTAL | 100.0% | 100.0% | 100.0% |
| Economic Restructuring and Policy Reform | 41.9% | 33.5% | 38.6% |
| Hunger | 32.9% | 34.4% | 33.5% |
| Health Deficiencies | 8.3% | 28.0% | 16.0% |
| Multisector | 16.8% | 4.1% | 11.8% |

Mortgage and Pipeline Performance

FY 1987 - 1994



particularly strengthened with a USDH Program Economist and a PSC Economic Reform Program Administrator. An IDI Program Economist and a FSN Economist are scheduled to on board by the end of 1988. The Agricultural Office has been strengthened with the contracting, through the MSU Africa Food Policy Initiatives Project, of an economist to research and advise on food policy and market liberalization dialogue, and the hiring of three FSN specialists, one with wide training and experience in private sector development. The Mission will also use project funds for a child health specialist to bolster our ability to help the MOH develop and implement the child survival program. The Mission has also institutionalized its ability to respond to droughts by Malianizing its Drought Relief Office and has strengthened its response capability for other disasters with a PSC logistics specialist.

The U.S. PVO community is increasingly serving as implementors of A.I.D.-financed projects. (Table 6 provides a list of USAID-funded PVO programs in Mali). PVO project activities, with but several exceptions, are in the Mission priority sectors. They are also an important element of the Mission's drought preparedness strategy. Our reliance on PVOs to implement programs will be expanded to encourage the PVO community active in Mali to participate in the implementation, through OPGs (which ease considerably the Mission management burden), joint ventures, subcontracts, etc., of several major efforts which A.I.D. is funding. An umbrella PVO project to encourage greater participation by the PVOs and to facilitate our administrative and management burden is also being considered.

V. Monitoring and Evaluation.

A. Broadened Mission Approach

In keeping with the current level of interest both within the Agency and among other interest groups such as the U.S. Congress, the Mission is placing an increasing emphasis on program monitoring and evaluation in the coming

FVO ACTIVITIES

| NAME OF FVO | ACTIVITIES | MISSION FUNDED | CENTRALLY FUNDED | LENGTH OF ACTIVITIES |
|--|--|------------------|--------------------|----------------------------------|
| FOSTER PLAN INTERNATIONAL | Banamba Health Project | | 200,000 | 1988 to 1989 |
| CARE/MALI | MACINA WELLS Macina Health Project | | 150,000 500,000 | May 86 to May 87 1987 to 1989 |
| | FFP Timbuctu Outreach Grant | | 562,812 | 1987 to 1988 |
| | Village Reforestation | 1,000,000 | | 1988 |
| Overseas Education Fund/ MFM/IVS (U.S.) | Mali Inst. Dev. & Nutrition | | 940,000 | 1988-92 |
| AFRICARE | Training Center for Rural women | 153,571 | | Nov. 1, 1985 to Sept. 1988 |
| | Child Survival - Strengthening | | | |
| | PHC in Dioro | | 123,000 (PA) | 1988 to 1992 |
| | Activities Paysannes | 300,000 | 1,723,000 | Oct. 1985 to Oct. 1988 |
| National Coop. Business Ass. | GHV Cooperative Development | 3,600,000 | | 1988 - 1989 |
| V I T A | Woodstoves | 658,000 | | April 1985 to Sept. 1987 |
| World Vision | Child Survival in Koutiala | 654,000 | | 1988 to 1991 |
| | Geo/Menaka Outreach | | | |
| | | | 822,903 | FY 87 |
| | | | 485,000 | FY 88 |
| Save the Children Fund USA | Training Families and Rural Communities in CS Behaviors | | 895,480 (PA) | 1988 to 1992 |
| Adventist Development Agency | | | | |
| PACT | Training of Malian NGOs | 50,000 (L.C.) | | March 1988 |
| IPVE | Local Food Distribution | 1,575,772 (L.C.) | | FY 86 |
| | | 184,230 (L.C.) | | FY 87 |

* PA = Pending Approval
* L.C. = Local Currency Equiv.

years. In contradistinction to previous efforts at monitoring and evaluation, however, the focus of our evaluation programs is now at a level higher than the project itself. In accordance with the A.I.D. Evaluation Handbook (April 1987), evaluations and monitoring programs are being designed to look at the effects of U.S. assistance on geographic regions and sectors, and upon the cumulative effects of assistance upon a given region or sector.

We have begun to institute a series of activities throughout the portfolio designed to measure the impact of the program as a whole. Over the FY 1990-1994 reporting period, this will involve an increased effort in two principal areas: data collection, both ongoing and timely, to develop objective measures of progress; and analysis of the data to improve program and implementation efficiency and modify program direction as required. To these ends we are making three changes in the monitoring and evaluation plan:

1. Project officers will monitor performance monitoring on a more regular basis to measure achievement of the project purpose. This has already begun, through a new Quarterly Project Monitoring form designed in the wake of the Sahel management audit.

2. We will collect data at a regional level. Initially, this will focus on the Second Region, the locus of some of the Mission's largest projects. Because this will take place at a level above that of the project, it will need to be funded through another source.

3. We will undertake special studies on the impact -- immediate or medium-term -- of specific interventions. Examples of this type of study are the ongoing Michigan State University monitoring of the impact of cereals market policy changes, the proposed impact analysis of the Manantali Resettlement Project (an OMVS activity), and the recent retrospective look at the USAID/Mali drought assistance program by PPC/CDIE.

Monitoring and evaluation will also include a new emphasis on financial auditing to focus on economy and efficiency. In accordance with the Agency's Payment Verification Policy statements established in a memorandum to Mission Directors from the Assistant Administrator for Management dated December 30, 1983, USAID/Mali has instituted new procedures to make wider use of independent public accounting firms to monitor the use of financial resources. USAID/Mali's Mission Manual Order 88--04 states in part:

It is Mission Policy to minimize the exposure of A.I.D. projects to fraud, waste, mismanagement or abuse. To this end, no less than once every two years each project will be audited. To implement this ambitious policy, every PP or PAAD prepared by the

Mission now includes project funding for this part of project monitoring.

B. Levels of Information Needs

There are two levels of information needs for monitoring and evaluation of projects. The first level is data which project managers and others need on a regular basis to follow implementation progress. With this information project managers can assess the rate at which inputs are flowing into the project and outputs are occurring, identify problem areas in a timely fashion, and make needed modifications. This can be termed input-output monitoring.

The second level is purpose and goal information to allow assessment of impact on the beneficiary population. Because of the problems of attribution (the difficulty of separating out the effects of project interventions on beneficiaries from the effects of other events), it is sometimes necessary to identify and monitor intermediate effects.

C. Objectives

The objectives of the Mission's monitoring system are to provide information, on an ongoing basis, to the Mission's decision-makers, both project managers and senior managers.

The objectives of the Mission's reporting system are to make this information available to A.I.D./Washington and other interest groups and stakeholders who need it. As part of this system, the Semi-Annual Project Review forms record progress at the project level. The Action Plan, prepared annually, provides specific, time-based benchmarks against which progress at the program level can be objectively measured.

The objectives of the Mission's evaluation system are to analyze how projects and programs are implemented, with the aim of improving the flow of A.I.D. resources.

The responsibility for managing the monitoring, reporting and evaluation programs lies with the Design and Evaluation Officer located in the Mission's Program Office.

D. Principal Program Benchmarks

As described in the body of this document, the Mission has selected three interrelated problems on which to focus the program for the next five years.

They are:

- (1) slow economic growth, caused principally by (a) inappropriate policies and state involvement in economic activities more efficiently performed by the private sector, and (b) technological, institutional, physical and policy constraints to agricultural development;
- (2) hunger and malnutrition, caused by inadequate food production and income, poor health, and dietary preferences and restrictions which inhibit nutritional intake; and
- (3) health deficiencies, particularly in children and mothers, resulting from an inadequate health care system, malnutrition, high fertility rates, and endemic disease; and an increased incidence of AIDS.

There is a variety of well-established indicators for each of these problems, and there are methods for measuring each of these and for measuring progress toward overcoming them. The Agency has established worldwide targets

for economic growth and for quantitative basic-needs levels of achievement, but these are not time-dimensioned. The baseline figures for Mali and tentative Mission projections for 1990-94 for each of these indicators are provided on Table 7.

D. Timing of activities

The program-level effort will be the subject of several data-gathering activities and impact assessments over the 1990-1994 period. In 1988 the Mission will undertake a regional study of indicators in the Second Region, partly in preparation for the implementation of follow-on activities. Project evaluations will continue to be carried out as needed, either as required by A.I.D. or the GRM, or specifically to answer a given management question. Project monitoring is a regular part of the Mission's activities.

Table 7
Goal-level Indicators
USAID/Mali CDSS, 1990-1994

| | <u>Agency Target</u> | <u>Mali Current value 1985-87 av.</u> | <u>Mali Projected Value 1990-94 av.</u> |
|---|--|---|---|
| 1. Economic Growth | | | |
| A. Gross Domestic Product | N/A | \$1.67 billion(86) | 1.95 billion |
| B. Per capita GDP | N/A | \$207 | 225 |
| C. Rate of change of GDP | 2% + pop. growth rate | 1.3% | 3.7% |
| D. Rate of change of per capita GDP | real rate of 2% | 1.7% (1982-86) | 1.0% |
| E. Government expenditures as a percent of GDP | N/A | 16% | 16% |
| F. Rate of change of government expenditures | N/A | 11% p.a. (1982-86) | 6.0% |
| 2. Hunger | | | |
| A. Average caloric intake of food, for key groups; and | achieve FAO critical level of food intake for 90% of population | Unknown | - |
| B. Extent of chronic malnutrition, as a percentage of the child population. | reduce percentage of children under 5 suffering from chronic malnutrition to under 20% | 13-35% | 15% |
| C. Growth of cereals production | - | around 0% | 3% p.a. |
| 3. Health Deficiencies | | | |
| A. Rate of infant mortality | 75/1000 live births | 173/1000 | 125/1000 |
| B. Rate of child mortality | 10/1000 | 350/1000 | 275/1000 |
| C. Life expectancy | 60 years | 47 years | 50 years |

ANNEX 1

Benchmarks of Progress Toward Attainment of CDSS Strategy Objectives

The following benchmarks are keyed to the assistance strategies discussed in Section III. The underlying assumptions are that, other than low rainfall there will be no major, long-lasting natural disasters; that current donor assistance levels will be sustained; and that the GRM will continue its program of economic restructuring and policy reform.

1. Benchmarks for Progress in Economic Restructuring and Policy Reform

- Regulatory reform. Prices of a greater number of products and services are deregulated or set more flexibly.
- Public finances. The government's deficit as a percentage of fiscal and non-fiscal revenues is kept below 5 percent. Bank credit outstanding to the government is kept within bounds. Government deficit financing and borrowings by state and mixed enterprises decline relative to total bank credit outstanding, freeing up credit for the private sector.
- Tax and customs reform. Administrative improvements in collections and assessment continue to be made and maintained, allowing rate cuts to be sustained. Fiscal receipts are large enough to cover 95 percent of government expenditures. Fiscal receipts grow at same rate as current-price GDP.
- Budget restructuring. Recruitment of civil service personnel does not exceed 2 percent of the civil service work force in any year. Growth of total payroll outlays, including wages in arrears and pay increases, do not exceed 6 percent a year. The ratio of non-personnel recurrent cost outlays for supplies and maintenance to personnel outlays remains above .30 and increases. The government increases the share of the government budget going to primary health care, primary education and agricultural development, while encouraging private sector initiatives in these areas and divesting itself of sole responsibility in such areas as the import and distribution of medicines. Government spending does not exceed 15 percent of GDP and does not grow faster, on average, than 6 percent per year.
- Private enterprise and employment. Owing to an improved regulatory and fiscal climate, and to credit policy more favorable to private business clients, output and employment in modern private sector enterprises (firms registered and filing tax returns) increase at least as fast as GDP grows.
- Privatization. The government divests itself from money-losing enterprises and cuts its losses.
- Credit and financial markets development. Monetary discipline is maintained and reinforced, but the WAMU/BCEAO system of credit rationing by credit ceilings on individual banks is administered at the national level more flexibly, to make it consistent with a shift of bank credit to a wider range of small enterprise and

cooperative-based borrowers. The share of credit going to private sector enterprises increases. The shares of credit going to small and medium enterprise loans and agricultural loans, respectively, increase. The number of term and checking accounts and total volume of deposits with the banks increase. Links are developed between informal sector organizations and the modern banking system, mobilizing increased savings from the rural areas and informal sector, part of which will be used to provide credit to rural area and informal sector entrepreneurs. The ratio of money broadly defined to GDP increases, while the ratio of currency outside banks to money declines.

- Foreign trade. Export volume continues to expand at a rate faster than GDP, at approximately 6 to 7 percent per year. The range of exports is expanded, through donor assistance directed at improving Malian businesses' market research capability as well as their knowledge of and ability to respond to export market opportunities. The rate of growth of imports is restrained to not exceed the rate of growth of GDP or exports consistently except in drought years.

2. Benchmarks for Progress In Agricultural Sector Activities

- Overall agricultural production. Increased availability of veterinary medicine and services; decline in animal mortality; increased forage and animal production in crop production zones; coarse grain yields increased; new soil conservation and agroforestry techniques tested and adopted by farmers; income-generating agriculture production and processing activities increased; less grain sold by farmers at harvest (when prices are low) due to greater income from other sources.
- Agricultural research. A functioning national agricultural research policy that responds to national development objectives and integrates all aspects of agricultural research at the regional and national level; a national agricultural research system fully equipped and staffed with Malian scientists in all priority areas; ten improved sorghum and millet cultivars released which are disease- and pest- resistant, drought-tolerant, and which yield 40 percent above local sorghum varieties and 20 percent above local millet varieties.
- Development of the Haute Vallee. A restructured extension/planning agency that effectively promotes improved technologies and coordinates extension and research activities in the Haute Vallee region; 228 village cooperatives formed and with private sector businesses and intermediate credit institutions engaged in mutually profitable economic activities in support of agricultural production in the Operation Haute Vallee (OHV) zone; 285 km. of rural farm-to-market roads constructed and maintained; crop production increased from 128,000 to 154,000 metric tons.
- Livestock. Diagnostic capability, vaccination coverage and immunization levels for large and small ruminants for the economically important diseases in Regions I and II increased from 45 percent to 70 percent; development of appropriate production and

animal nutrition technical packages which are adopted by a significant number of producers in Regions I and II; Livestock Ministry with capacity to plan, formulate and evaluate livestock policies and programs, and capacity to design, implement and coordinate program activities.

Natural resources. Increased awareness and understanding of Mali's ecological systems and the socio-economic associations affecting resource use and policy development; appropriate natural resource management technical packages developed which are adopted by a significant number of small farmers in Regions I, II and V; land tenure and resource policies in effect which improve natural resource management and production by giving control and management responsibility to villagers.

Cereals policy. Inter-seasonal and inter-annual storage undertaken by private traders; price fluctuations reduced; access by farmers and traders to grain storage credit increased; greater price integration among regions and markets; costs of rice production reduced; rice yields substantially increased; private sector with major role in purchasing and milling rice (paddy).

3. Benchmarks for Progress in Health, Family Planning and Nutrition

- Use of ORT by at least 50 percent of children's diarrhea cases set at project health centers; a 10 percent decline in child mortality owing to diarrheal diseases; vaccination coverage of 80 percent and revaccination coverage of 50 percent of mothers and children in project areas, with a corresponding decrease in illness and deaths from the diseases targeted; an increase to at least 10 percent in national prevalence of use of effective contraceptive methods resulting from improved knowledge of and accessibility to such methods; 10 percent reduction in childbirth-related illnesses and mortality among women; improvements in health and population data collection and availability; a blood supply 100 percent free of AIDS viruses; a population at least in urban areas that is well-informed of the risks of AIDS and the means to prevent it; an increase in the availability of essential pharmaceuticals at prices affordable by the general populace; and a strategy for a sustainable health and family planning delivery system down to the village level by 1994.

In the nutrition subsector: a reduction in moderate/severe malnutrition to less than 20 percent of the children in the project area (Bamako/Koulikoro); and a nutrition social marketing message seen and understood by 50 percent of the national population.

ANNEX 2

BIOLOGICAL DIVERSITY AND TROPICAL FOREST CONSIDERATIONS IN MALI

A considerable portion of the Mission's current portfolio involves natural resource management activities, including agricultural, forestry, soil and water conservation, and biological diversity-related interventions.

Since the issuance of 88 STATE 32584 on February 3, 1988, however, insufficient time has been available to obtain, compile, analyze and summarize the immense body of specific background technical material required to prepare the tropical forest/biological diversity analysis by Sections 118 and 119 of the FFA at a level of detail commensurate with the recommendations of the AID/' Biological Diversity Working Group as described, and commensurate with Mission's desire for a solid technical framework within which to guide future biological diversity dialogue/initiatives. Given Mali's significant biological resources, the Mission's ongoing support for such biological diversity-related activities as those conducted by the International Union for the Conservation of Nature (IUCN) in the inland delta of the Niger River, and Mali's status as a Group 1 country within the Natural Resources Management Support (NRMS) Project framework, the Mission has requested that a thorough technical background assessment of tropical forest and biological diversity conservation and management in Mali be funded and prepared through the NRMS Project. (A draft of a portion of a biological diversity assessment was prepared by Peter Warshall as part of the NRMS review of successful natural resource interventions. The Mission expects the final NRMS review shortly. Readers may refer to AFR/TR/ARD.)

The Mission plans to complete the biological diversity assessment and review of tropical forests before the end of FY 1988. The final assessment will be used to modify, where necessary, the Mission's strategy and proposed activities outlined in the following paragraphs.

BIOLOGICAL DIVERSITY

Background

Mali is experiencing a significant degradation of its natural resource base affecting most of its biotic communities and natural regions. The actual rate of degradation is unknown due to unreliable data. Remnants of woodlands are being disturbed with resulting increases in regeneration gaps and a very low replacement power of the tree species.

Species richness and individual species density in most strata of biotic layers are being reduced by excessive human exploitation and by some traditional management practices such as: bush fires, logging, and tree mutilation (inappropriate tree cutting techniques for browse). Population expansion and population movements due to drought have also had a detrimental effect on biological diversity. New settlements result in exploitation of the surrounding vegetation which in some cases may represent rare species that do not regenerate.



Populations of the higher forms of animal are now confined to isolated spots where their protection and conservation are linked to the access, distance and technological capacity, i.e., mobility and types of weapons of the local population. As a result of droughts and unplanned land use systems, the traditional area devoted to transhumant cattle herding are pushing southward. Most plant species useful to humans for food, medicinal purposes, trade, animal feed, or housing are overused and subject to the "southward syndrome" of reduction of their ecological range. Most of the best lands are exploited. The degraded land area is expanding due to trampling, overgrazing and erosion and the lack of development control.

The Mission-funded land resources inventory project (PIRT) has provided the main study of Mali's land resources and biological diversity. Sixty-eight soil/vegetation units of differing area coverage have been identified outside the inland delta. The biological diversity of these various agro-ecological zones will be severely strained of existing trends of climate and human pressure continue.

Some characteristics which influence biodiversity conservation in Mali:

1. Low level of GRM political commitment which makes it uncertain that any conservation program or activity can succeed, thus jeopardizing donors' efforts and interests. Wildlife conservation is still very much regarded as a non-priority area even though the imperative to conserve is recognized as necessary for survival of the habitats.

2. Legislation promulgated without adequate consideration of the needs of the population affected by the regulations. For the last ten years the GRM has introduced a number of legislative measures such as a ban on hunting, a ban on bush fires, and controls on encroachment on fallow lands in order to protect and maintain the biological diversity. Most observers agree that these measures are ineffective. They are not being enforced at the field level. These decrees have not been supported by field level management changes necessary to make the law effective. As an example, simply outlawing the use of bush fire is not sufficient if the local population still depends on fire as their only means of harvesting wild honey essential to their diets. Because of the lack of GRM budget resources necessary for enforcement and/or developing alternatives and except to use the natural resources for sustenance and survival, it is likely that people will continue to exploit the natural resources in the same manner as they have in the past.

3. Absence of any conservation success story within the country whether ecosystem or species-oriented. Conservation areas near big settlements or cities are opened to indiscriminate poaching and areas far afield are unlikely to receive significant management due to low level of logistical and human resources.

4. Absence of a nationwide formal conservation strategy.

5. The existing network of conservation areas including savannah woodland and nature reserves of different biological zones inherited from the colonial area amount to over 35,000 sq km. They included a wide range of biotic communities the status of which is the most part unknown. An adequate management strategy and capability for these natural reserves does not exist.

A.I.D.'s proposed activities to support biodiversity

Natural resources management is a discrete but important share of the Mission's current portfolio mostly through the support and promotion of crop and forage selection, soil conservation and agro-forestry activities. Two functional aspects of biodiversity are key concern to the Mission, i.e., ecosystem and genetic diversity which are being approached through IUCN conservation project in the inland delta of the Niger River, the national and regional agricultural research bodies, the Development of the Haute Valle Project, the Livestock Project and the Village Reforestation Project. Beyond these current activities which need to be strengthened on a case-by-case basis, the Mission will have impact in the following areas:

1. The Semi-Arid Crops Research Project (ICRISAT) will maintain/increase genetic diversity through development of germplasm in its sorghum and millet breeding program and its maintenance of sorghum, millet and weed seed banks.
2. We will encourage regeneration of species intensively and extensively used through planting in project areas, i.e., acacia alba and "bourgou" grass.
3. Environmental education will be expanded through focused short and long term training. The Mission will continue to support through IUCN publication of their educational bulletin, WALIA.
4. Natural forest management for communities' space needs on a sustainable basis through the Village Reforestation Project.
5. We propose to assist the IUCN branch which will be opened in Mali in the near future. IUCN can fill, to a large extent, the gap in the information base as well as support wild life, habitat and environmental protection. We see IUCN as the appropriate agency to deal with institution building issues related to biological diversity.
6. We will continue policy dialogue with GRM on aspects affecting sustainable and diversity-rational use of natural resources management, i.e., forestry police, land tenure, pastoral code.
7. We plan to help Malian and foreign PVOs build their capacity in natural resources management and environmental education.
8. The Mission plans to create and maintain a databank within the ongoing projects with emphasis on natural resource management.
9. We will encourage and facilitate, but not fund, university research and independent studies of ecological and biological diversity topics as a method of increasing the knowledge base. Such studies might include studies of the traditional agro-forestry systems and the way they support agriculture production. An interesting study would be to define the habitat and the range of the chimpanzees which are no longer seen in West Africa except Mali, as well as fresh water species like the manatee reportedly overfished in the Niger River.

ANNEX 3

USAID SUPPORT TO AGRICULTURAL RESEARCH IN MALI 1990-1994 CDSS

I. OVERVIEW OF THE MALIAN NATIONAL AGRICULTURAL RESEARCH SYSTEM (NARS)

Agricultural research in Mali began under the French colonial administration in 1925 with the establishment of a cotton research station at M'Pessoba. In 1932 the Office du Niger was created to promote irrigated production of cotton and rice and a research program was initiated. Until independence in 1960 crop research was conducted at these two locations.

The Malian government (GRM) assumed administrative control of agricultural research in 1962, just two years after Independence, with the creation of the national agricultural research organization, the Institute of Rural Economy (IER). This Institute was placed under the responsibility of the Ministry of Agriculture. The most significant policy change made in transition from French to Malian administrative control was an increased emphasis on food crops relative to cash crops. However, until 1977, crop research was conducted almost entirely under contract by a number of French agricultural research institutes, most notably the Institute for Tropical Agricultural Research (IRAT). IRAT advisors continue to play an important role in the discussions and meetings in which national research priorities are reviewed and set.

Livestock research was also begun under the colonial regime, and was turned over to direct Malian government control at Independence. It was managed by the Center for Livestock Research in IER. The National Institute for Research on Livestock, Forestry, and Hydrobiology (INRZFH) was formed in 1981, removing livestock research from the control of the Ministry of Agriculture and placing it under the management of the Ministry of Rural Development now renamed as the Ministry of Natural Resources and Livestock (MNRE). The Agricultural Engineering Division (DMA), which does research on farm mechanization (including animal powered equipment), remains in the Ministry of Agriculture, but is not administratively under the IER.

Thus at present the three institutes IER, INRZFH and DMA constitute the national agricultural research system (NARS) with the agronomic research (including the related social and economic research) under the IER (Ministry of Agriculture); livestock and forestry research under INRZFH (Ministry of Natural Resources); and agricultural mechanization under DMA (Ministry of Agriculture). Agricultural education and training is the responsibility of two other institutions. The Rural Polytechnic Institute (IPR-Katibougou) under the Ministry of Education offers two levels of specialized training in each of the three disciplines (agriculture, animal husbandry, forestry) leading to a degree equivalent to a B.S. (Ingénieur des Sciences Appliquées) and a lower-level technical degree (Ingénieur des Travaux Agricoles). The National Directorate of Training and Rural Animation (DNFAR) under the Ministry of Agriculture trains Moniteurs of Agriculture (MAs) in three institutes known as Agricultural Training Centers (CAAs). MAs are the lowest level of professionally trained personnel serving research and extension agencies at the field/village level.

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Mali's NARS is relatively young with a limited but gradually increasing number of well trained national researchers. It has not had a well-defined research program nor sufficient monetary resources. It is only during the last ten years that the NARS has received donor support, going beyond research provided by the French. Farming systems research (Dutch, IDRC, USAID), sorghum and millet research (USAID, CIBA-GEIGY Foundation), pest management (USAID), and deep water rice research (USAID) are all relatively recent investments. See Table 1 for more details on donor support.

The problems of focus and coordination of agricultural research (and in particular the relationship between the two major institutions (IER and INRZFH) have been studied and widely acknowledged for years, most recently by the FAO, ISNAR, and USAID in separate analyses. Despite a GRM commitment to merge these two institutions, actual implementation has not been effected. Only in the recent past has USAID succeeded in initiating an informal set of coordination efforts among researchers in the two institutes working on similar problems (such as forage research); already this informal effort is bearing fruit in increased research efficiency.

An ISNAR/World Bank activity undertaken at the initiative of the GRM, will assist the GRM in preparing their own national agriculture research plan which should result in a reorganization and clearer priority-setting for agriculture research for Mali. As the major donor in agricultural research, USAID will assist ISNAR and the GRM in developing the plan. The agricultural research plan, which will be completed prior to the beginning of the CDSS period, is likely to lead to increased donor assistance in agricultural research.

II. PROGRESS IN THE DEVELOPMENT OF TECHNOLOGIES - A BRIEF ASSESSMENT

Considering the lack of trained and experienced research personnel, the extremely limited resources, the relatively young research organization and the long timeframe required for finding technological solutions to a range of complex production problems, which are further constrained by uncertain rainfall, the establishment of the research system base and the development of Notwithstanding these constraints, technologies which have been transferred to the extension agencies/ farmers has been substantial. Several of these technologies have produced significant improvements in the cropping systems, overall production, and farm income. With the exception of cotton, many of these technologies were developed under USAID funded projects. Below is a summary of these techniques.

1. Cotton: cotton variety now cultivated by a majority of cotton farmers is B-163; Mali's relatively stable cotton production is attributed to this variety. A package of cultural practices and fertilizer recommendations has been developed and updated to accompany these varieties. Two very promising varieties recently identified are K-170 and B-431-6. Cotton yields nationwide are the highest in Francophone West Africa.
2. Maize: the varieties "Tiémantié de Zomblara"; Zanguereni and IRAT-2-81 have received wide acceptance by the farmers.
3. Sorghum: eighteen varieties have been tested on a large scale, of which seven have received varying degrees of acceptance. They are Tiémarifing; CE-90; SH2D2, CSM-219; CSM-388; VS-703; CE111-6. The first two have been among the most widely adopted.

4. Millet: twelve millet varieties have been tested on large scale under farmers' conditions and four have been adopted in varying degrees. They are: M9; NKK; IBV-8001; NKK 3/4.
5. Peanuts: of the three varieties promoted by the extension agencies (47-10; 28-206; 55-457), the first two have been widely adopted.
6. Cowpeas: four varieties TVX 32-36; KN-1; TN88-63 and Gorom Gorom (or Suvita-2) have been tested. Except TN 88-63 the rest have received good response from farmers, some being rapidly adopted even before being officially accepted by the GRM as varieties to extend.
7. Cropping Systems: maize-millet improved intercropping system has received wide acceptance in the CMDT zone and is known to have significantly contributed to increased production. Research on the improvement of some of the promising cropping systems is underway (sorghum-peanut; millet-peanut).
8. Tilemsi Natural Phosphate: (TNP) powdered form of natural phosphate found in Mali has been widely researched and tested over a number of years both under controlled experimentation and under farmers conditions. Results proving the beneficial effect of the natural rock phosphate on crop yields have been confirmed. The practice has been promoted by the extension agencies. Initial farmer relevance to use TNP (because it looks like ordinary dirt) has been overcome in areas where it has become an extension focus.
9. Updating fertilizer recommendations: significant efforts are devoted to updating fertilizer recommendations principally on cotton where their use has proven to be economical and sustainable. Residual effects of cotton fertilizer on subsequent cereal rotations has permitted substantial increases in cereal yields where cotton is grown.
10. Package of improved animal traction: technologies developed under the farming systems research program (Sikasso) have become the principal means of improving animal traction productivity in the southern zone (improved harness; oxen training; on-farm management of oxen-housing-feeding; production of fodder, collection of manure; farmers in equipment operation and maintenance). Unlike many other West African countries, animal traction is widely used in Mali and has played an important role in increasing farm production and income.
11. Livestock development: testing and production of vaccines for livestock disease control is well known through the Central Veterinary Laboratory. Research on production of fodder, crop residue management, improved fallows for grazing and improved soil fertility and on-farm management of livestock is continuing through INRZFH.

III. USAID ROLE AND CONTRIBUTION TO AGRICULTURAL RESEARCH IN MALI (1978-88)

USAID plays a major role in strengthening the national agricultural research system in Mali and is the principal donor to the Institute of Rural Economy and probably INRZFH. In 1986, the USAID contribution to IER's capital cost and operating expenses accounted for 34 percent of its total budget, with the GRM contributions amounting to around 39 percent. Of the total donor support to IER, USAID accounted for 55 percent (See Table 1). These expenditures include capital costs of institutional development, operating costs and limited technical assistance.

Between 1978-80, USAID funded modest investments in agricultural research as a component of several of its major agriculture production projects: Operation Mils Mopti (OMM); Operation Haute Vallee (OHV); Operation Riz Sorgho (ORS);

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and Action Ble Dire (ABD). Funds were passed from these projects to the appropriate research units to conduct adaptive research in the production zones of the projects. This approach had two major disadvantages. Research funding was caught up in the implementation problems associated with these production projects. It was difficult to establish a critical mass of research expertise engaged in problem solving research in the context of these relatively short duration projects. Recognizing these problems and the need for more effective technologies in Mali in general, USAID funded ICRISAT/Mali as a bilateral project in 1979. Thus the independent project approach to funding agricultural research came into being.

Livestock Sector Research

Research within the Livestock Sector has centered on animal health and animal production. AID-funded animal health research began in 1976 with the tsetse fly/trypanosomiasis research. Texas A&M University provided initial technical assistance to the Central Veterinary Laboratory (CVL) to develop their research capabilities in trypanosomiasis and other vector-borne diseases. Animal health research funded under the Mali Livestock Sector II Project is continuing at the CVL currently focusing on applied research activities including the economic importance of trypanosomiasis, tick-borne and parasitic diseases, epidemiological studies on small ruminant respiratory diseases and other viral diseases of economic importance, and continuation of studies on tsetse control.

AID funding of animal production research began under the Mali Livestock Sector II Project in 1982 and has focused on animal nutrition and forage production research in the semi-arid zone. These efforts are being broadened to now include the subhumid zone around Bamako to specifically address milk production potential. As well, natural resource management activities are being increasingly integrated as a research emphasis. The adoptive forage production research program will serve in this regard to stabilize existing cropping systems and improve animal nutrition by increased use of forage legumes and tree crops.

Today, USAID supports agricultural research in Mali through bilateral, regional, and central projects, as well as collaborative research support programs (CRSPs), totalling approximately \$2.5 million annually. (See Table II for detail description of projects). All of these projects are implemented by IER (except for livestock research implemented by INRZFH) and have been complementary and mutually beneficial to each other.

The present portfolio meets two of the several critical needs of agricultural research and development in Mali. First, most USAID projects are focused on improving the technology base related to sorghum and millet production. This emphasis is necessary since sorghum and millet are the major cereals, and NARS's capacity to conduct research in this area has not been commensurate with the need and complexity of the problem. Second, the focus of the portfolio is on 1) improving the relevance of on-station research in Mali via a better understanding of the production systems and of farmers problems and constraints; 2) adapting technologies to farmers' conditions; and 3) communicating to the on-station researchers farmers problems and constraints as well as performance of technology in the field. Although the present portfolio addresses certain critical needs, there are other areas that need immediate attention if the technology development and transfer efforts to

improve food production are to have their full impact. These areas are: 1) strengthening soil fertility and soil moisture management research; 2) disease and pest control research including post harvest concerns; and 3) strengthening the capacity for multi-locational on-farm testing.

Bilateral Projects

- a. Forage and Animal Health Research Component of the Livestock Sector Project (688-0218)
- b. Semi-Arid Tropics Crops Research Project (688-0226); and its 4-year follow-on project;
- c. Farming Systems Research/Extension Project (688-0232); and the
- d. Proposed Agricultural Research Support Project (688-XXX) which will assist the GRM in managing a sustainable national agriculture research system and will ensure continuation of efforts from phased-out AID projects: Regional Projects Integrated Pest Management, SAFGRAD/ACPO, WARDA and the bilateral Land Use Inventory Project - PIRT.

Centrally Funded Projects

- a. PSTC grant with University of Nebraska, and the
- b. Collaborative Research Research Support Project (CRSPs), INTSORMIL (625-0926) and TROPISOILS.

These activities will be folded into the follow-on Semi-Arid Crops Research Project.

Regionally Funded Project

- a. Semi-Arid Food Grain Research and Development (SAFGRAD) (698-0452)
The Accelerated Crop Production Officers (ACPO) portion of the SAFGRAD project which was the principal unit conducting multi-locational on farm tests in Mali ended March 30, 1988. USAID is supporting a continuation of multi-locational testing as part of the collaborative research element of the Farming Systems Project. This is an interim arrangement until the on-farm multi-locational testing is funded by the National Research System as part of each regional station.

IV. USAID STRATEGY OF SUPPORTING AGRICULTURAL RESEARCH

The purpose of USAID's agricultural research portfolio is to assist the GRM in the development of improved technologies adapted to farmers' needs through strengthening Mali's national agricultural research system. The future objectives and priorities of our research portfolio will be focused on: improving technology related to sorghum and millet crop improvement and development; improving the relevance of on station research via a better understanding of production systems and of farming problems and constraints; improving animal nutrition and forage production research; strengthening soil and moisture management research, disease and pest control research including post harvest concerns, the capacity for multi-locational testing.

The attainment of a self-sustaining national agricultural research system will require:

- a. the development of a national agricultural research policy and implementation strategy;

- b. national research stations covering the principle crop and livestock diseases and pests.
- c. well equipped and functioning regional research stations covering the principal crop/livestock production areas;
- d. at least ten Malians trained in each major crop/livestock related field and working in the agricultural research sector.
- e. national budget or donor support to cover recurrent costs.

Once the national agricultural research system is fully established expected outputs related to the development of improved technologies will be:

- a. increased food security for the country and the rural population;
- b. reduction of farmer risk, improved incomes and nutrition level;
- c. by 1994 at least five varieties of millet and six varieties of sorghum which are drought resistant, at least 20 percent higher yielding than traditional varieties, and pest and disease resistant developed, tested at the farm level, and promoted by extension agents;
- d. Improved technologies on cropping systems based on cereals and legumes and improved technologies on cultural practices developed, tested, and extended to farmers.
- e. Improved livestock production due to ability to rapidly diagnose diseases, provide vaccines and due to forage production and nutrition technologies.

The resource required to produce the above outputs is USAID's continued commitment to invest in agricultural research in Mali through research projects for sorghum and millet improvement, farming systems, livestock health and forage production, and support for the national agriculture research system.

Through the implementation of the research projects in its portfolio USAID will focus its efforts on:

1. Assisting the GRM to establish a strong national research strategy plan and seek to use it as the framework for soliciting and coordinating donor assistance (both public and private) to research.
2. Improving management and administration of the National Agriculture Research System - both IER and INRZFH:
 - upgrade the managerial capacity of key individuals;
 - improve the financial planning and budgeting process to align financial resources with research objectives;
 - setting in place cost-effective systems to evaluate effectiveness of research expenditures;
 - improve personnel management systems;
 - make managers and scientist accountable for results or lack hereof.
 - training and technical assistance in research station management.
3. Establishing reliable relationship between research organizations and other organizations upon which they depend as well as to establish sound avenues for the exchange of information with groups they are expected to support (extension agents and farmers) e.g. scientific writing, seminars, workshops, etc.

4. **Strengthening collaborative efforts among donors** in order to prevent further redundancy and fragmentation of national programs that has resulted from diverse projects put in place without sufficient coordination. Having a national agriculture research strategy will be of great assistance in accomplishing this objective.
5. **Building institutional capacities** through participant training programs which take into account the scientific manpower needs, providing research equipment, and construction of research facilities.
6. **Operationalizing zonal networks with other national research systems and regional and international research centers** to produce improved technologies through a more cost-effective approach, reducing country-by-country duplication of efforts and improve testing and dissemination among scientists of research information.
7. **Assisting GRM to define explicit program objectives and priorities** focusing on improving technology related to sorghum, millet, crop improvement and development; improving the relevance of a station research via a better understanding of the production systems, farming problems and constraints; strengthening soil and moisture management research, disease and pest control research including post harvest concerns, and strengthening the capacity for multi-locational testing.
8. **Establishing a long-term commitment** to agricultural research of 20 to 25 years as the minimal acceptable planning period for assistance to Mali agricultural research systems.
9. **Ensuring proper conditions for the adoption of technologies generated by investments in research.** USAID will continue to work with other donors in promoting economic and policy reforms to liberalize cereals marketing and provide increased opportunities for private enterprise participation in support services needed for agricultural development e.g., input supply and distribution (fertilizers, seeds, implements) and credit. AID plans to engage in policy dialogue in other areas which affect farmers' willingness to adopt technologies such as national resource policy, land tenure, transportation policy, etc.

TABLE 1: PERCENTAGE BREAKDOWN OF CONTRIBUTIONS TO THE INSTITUTE OF RURAL ECONOMY (IER)
IN 1986 FOR CAPITAL COST AND OPERATING EXPENSES (1)

| DONORS | PERCENT OF IER'S TOTAL 1986 BUDGET | MAJOR RESEARCH FOCUS |
|--------------------|---------------------------------------|---|
| Government of Mali | 38.6 | all crops |
| USAID | 33.8 | millet, sorghum, corn, wheat, farming systems research, pest management |
| French | | cotton, soil/plant/water relationship |
| World Bank | 7.9 | cotton, phosphate, rice seed production, |
| Canada (IRDC) | 3.7 | food legumes, farming systems research |
| FAO | 0.2 | fruit and vegetable seed production, |
| FED | 0.2 | millet, sorghum, cowpeas, corn, rice varietal testing |
| Ciba-Geigy | 1.9 | millet, sorghum, corn, cowpeas |
| Dutch | 13.7 | soil/plant/water relationships, rice, farming systems research |
| | 100 | |

Source: 1986 Rapport Annuel Institute D'Economie Rurale

1. This breakdown is based only on the amount of money that flows through IER for capital costs and operating expenses. It does not include those expenditures paid directly by donors such as salaries to technical assistants, which is the French major contribution.

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TABLE 11: 1990-1994 MALI/CDSE --AGRICULTURAL RESEARCH PORTFOLIO

| Project Name | Number | Planned FACD (FY) | Total LDP (\$000) | Project Objectives | Accomplishments/as of April 1987 |
|---|--|-------------------------|-------------------------|--|---|
| BILATERAL PROJECTS: | | | | | |
| Semi-Arid Tropics Research II | 688-0226 | 9/30/90 | 7,500 | <ul style="list-style-type: none"> - Develop technical packages for improved sorghum/millet and grain legume production in the 400-1000 mm rainfall zone | <ul style="list-style-type: none"> - Corn/millet intercropping proven productive - Two sorghum varieties ready for on-farm testing. Progress in disease screening for millet. - Soil management/conservation practices established at Cinzana Research Station |
| <p>Implementing Agencies: GRM Institute for Rural Economy (IER) / ICRISAT</p> <p>Phase III four year extension planned. By 1994 Mali's national program for sorghum and millet research should be able to operate without technical assistance.</p> | | | | | |
| Farming Systems Research/Extension | 688-0232 | 9/30/94 | 19,493 | <ul style="list-style-type: none"> - Develop foodcrop technology relevant to farmers needs and circumstances, including - Develop technology on soil/water relationships and agro-forestry - Promote transfer of such technology. - Train researchers, develop research strategy, institution-building. | <ul style="list-style-type: none"> - Technical Team in country. Office construction plans underway. Placement of 8 Malians to U.S. Universities arranged. Rapid reconnaissance survey conducted. 1987/88 research plan underway. |
| <p>Implementing Agencies: GRM Institute for Rural Economy (IER) South-Eastern Consortium for International Development (SECID)</p> | | | | | |
| Dire Agronomic Research | 625-0929D | 4/30/89 | 235 | <ul style="list-style-type: none"> - Test improved varieties of irrigated wheat, millet, sorghum, and rice - Develop agronomic techniques for irrigated production. | <ul style="list-style-type: none"> - Around 525 lines of wheat have been screened. - Improved local varieties of wheat will be available for distribution soon. Many varieties of millet, sorghum, and rice have also been screened. - Research on fertilizer use continues. |
| <p>Implementing agency: GRM Institute of Rural Economy (IER)</p> | | | | | |
| Agricultural Research Support Project | Project is in identification stage Concept paper prepared | | | <ul style="list-style-type: none"> - To continue the long term efforts begun by USAID to strengthen the Mali national research systems by ensuring that the physical infrastructure and qualified human resources are organized so they contribute to the development of agricultural technologies in the most efficient/productive manner. | <ul style="list-style-type: none"> - The project will provide a research advisor and a financial management advisor to assist in implementing the national agriculture research plan. - The project will also insure continuation of those efforts started with AID regional and central funds: SAFERAD/ACPO, Integrated Pest Management, peanut (CRSP) and WARDAs; and two bilateral projects PIRT and the Dire Agronomic Research Station (FACD 1989) |
| <p>Implementing agency: GRM Institute of Rural Economy (IER) unless combining research institutes results in a new agency.</p> | | | | | |

MM

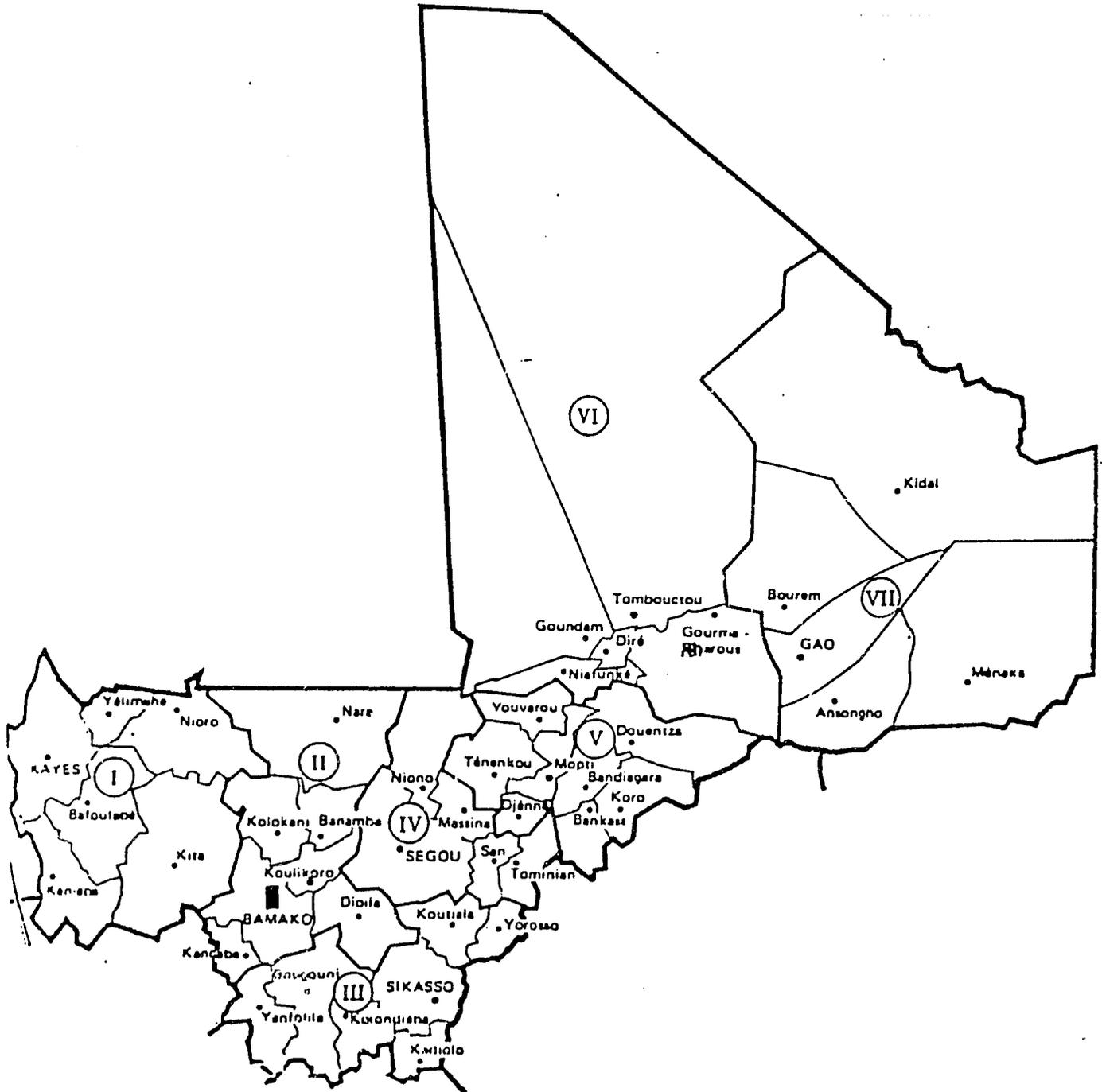
TABLE II: 1990-1994 MALI/CDS5 --AGRICULTURAL RESEARCH PORTFOLIO

| Project Name | Number | Planned FACD (FY) | Total LDP (\$000) | Project Objectives | Accomplishments/as of April 1987 |
|--|----------|-------------------------|-------------------------|--|--|
| Livestock Sector II | 688-0218 | 9/30/91 | 9,000 | <ul style="list-style-type: none"> - Improve forage production technologies - Improve animal nutrition for fender and traction animals - Develop appropriate management systems for integration of livestock and crop production - Integrate animal health inputs for increased production | <ul style="list-style-type: none"> - Compea and Lablab purpureus have been shown to be adapted annual forage legumes cut of over 40 species screened for the semi-arid zone - Weeding trials indicate labor time is an important constraint to establishing forage fallow. Animal traction is important to reduce labor input into cereal crops; this might enable farmers to expend time on establishment of forage fallow. - Hay storage trials indicate traditional system of drying in the field is as efficient as project proposed systems. - Doubling the seeding density of compeas and Lablab purpureus increased forage yields by 30 to 40 percent. - Reducing cotton seed supplement by 50 percent increased economic profitability of feeding trials. - Trials showed that the primary constraint to small ruminant production in the semi-arid zone is disease, not nutrition as with cattle. |
| Implementing agencies: | | | | | |
| GRM Institute for Research on Forestry, Zootechnology and Hydrobiology (INRZFH) International Center for Livestock in Africa (ILCA) | | | | | |
| CENTRALLY FUNDED PROJECTS: | | | | | |
| CRSP/INTSQRMIL | 921-1254 | | 50 | <ul style="list-style-type: none"> - Establish active, collaborative research relationships that will contribute to the developing/improving sorghum and millet varieties through breeding, pathology, entomology, cultural practices, physiology, etc. | <ul style="list-style-type: none"> - Breeding/drought physiology work has begun. - Technical backstopping to Mali research programs has been provided. Assisted in training staff. - Techniques developed for food quality evaluation. - Introduced sorghum germplasm (from US and Central America with desirable drought resistance and better food quality. - Developed techniques for screening seedling stage drought resistance. |
| Implementing agency: | | | | | |
| GRM Institute of Rural Economy (IER) University of Nebraska/Texas A and M | | | | | |
| CRSP/TROPSOILS | 931-1311 | | 15 | <ul style="list-style-type: none"> - Develop technologies to increase the productivity of soils in Mali. | <ul style="list-style-type: none"> - Began research on soil management using: <ul style="list-style-type: none"> land preparation techniques without fertilizers land preparation techniques with fertilizers. |

ANREX 4

MAP No. 1 ; MALI ADMINISTRATIVE MAP

- Capital
- Regional Capital
- Cercle Administrative Center
- (IV) Region Number



1 : 90 000 000

Mali



502728 9-77 (542184)
 Lambert Conformal Projection
 Standard parallels 8° and 32°
 Scale 1:1,000,000
 Boundary representation is
 not necessarily authoritative

- Railroad
- Road
- ✈ Airport

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ANNEX 5

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