

UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

PROJECT PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

AFRICA REGIONAL - Entente Food Production

AID-DLC/P-2156

UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20521

UNCLASSIFIED
AID-DLC/P-2.56

May 12, 1976

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Africa Regional - Entente Food Production

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed Eight Million, Seven Hundred Ninety Dollars to the Mutual Aid and Loan Guaranty Fund of the Council of the Entente States ("Cooperating Institution") to assist in financing certain foreign exchange and local currency costs of goods and services required to assist the Entente States to make necessary adjustments in their agriculture sector policies which will enable them with the assistance of the Cooperating Institution, to implement a strategy of assistance to small farmers and to evaluate its effectiveness as a means of meeting the needs of the Entente States for increased food production.

The loan proposal is scheduled for consideration by the Development Loan Staff Committee on Thursday, May 20, 1976 at 2:30 p.m. in Room 3886 NS; please note your concurrence or objection is requested by c.o.b on Tuesday, May 25, 1976. If you are a voting member a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development Program Review

Attachments:

Summary and Recommendations
Project Analysis
Annexes A-I

ENTENTE FOOD PRODUCTION PROJECT

PROJECT PAPER OUTLINE

I.	SUMMARY AND RECOMMENDATIONS	1
II.	PROJECT BACKGROUND	
	A. Agricultural Evolution of Entente Nations	1
	1. Agricultural Policy	5
	2. Soil Fertility	6
	3. The Effect of the Drought	8
	4. Food Crop Production, Absolute Level and Self-sufficiency	11
	B. Small Farmer Development Strategy	26
	C. History and Development of Proposal	27
	1. Background of Project Proposal	27
	2. Evolution of Project Concept	29
III.	DESCRIPTION OF PROJECT	
	A. Goal and Purpose	31
	B. Project Outputs	32
	C. Project Inputs	36
	1. Capital Assistance	36
	2. Technical Assistance Plan	37
	D. Eligibility Criteria for Subprojects	40
	1. Eligible Beneficiaries	40
	2. Eligible Subprojects	40
	3. Criteria for Subprojects	41
	4. Terms of Subloans	42
	5. Terms for Agricultural Credit	42
	6. Source/Origin Procurement	43
	7. Borrower Contribution	45
	E. The Borrower and Implementing Agencies	46
	1. The Entente Fund	46
	2. Implementing Agencies	46

F. Subproject Approval Process	49
G. Illustrative List of Subprojects	50
IV. PROJECT SOUNDNESS ANALYSIS	
A. Technical Analysis	55
1. Technical Design of Project	55
2. Subproject Analysis Framework	55
3. Appropriateness of Agricultural Technology	60
4. Environmental Assessment	61
B. Social Soundness Analysis	64
1. Beneficiaries of Project	64
a. Small Farmers	64
b. Women in Rural Development	65
2. Social/Cultural Feasibility	66
3. Spread and Replicability Effects	67
4. Development of National Capabilities	67
C. Institutional Analysis	69
1. The Entente Fund	69
2. The Entente Member States	70
a. Ivory Coast	71
b. Benin	73
c. Togo	74
d. Niger	75
e. Upper Volta	79
D. Economic Analysis	85
1. Cost-Benefit Analysis	85
2. Macro-economic Soundness	85
a. Balance of Payments	85
b. Overall Development Policy	86
3. Micro-economic Soundness	88
E. Financial Analysis	89
1. The Entente Fund	89
a. Sources of Funds	89
b. Uses of Funds	90
c. Overall Financial Capability	92
2. The Entente Member States	93
3. Prospects for Repayment	93
a. Financial Capacity	93
b. Maintenance of Value Provision	94

V. IMPLEMENTATION PLANNING

A. Administrative Arrangements	96
1. The Entente Fund	96
2. Entente Governments	96
B. Implementation Plan	97
1. Responsibility and Mechanism for Implementation	97
a. The Entente Fund	97
b. AID	98
2. Subproject Agreements	99
3. Subproject Submission and Approval	99
4. Technical Assistance	100
5. Implementation Schudel	101
C. Evaluation Plan	102
D. Disbursement Procedures	102
E. Conditions Precedent	103
F. Covenants	103
G. Justification of Waivers for Procurement	104
H. Negotiating Status	106
I. Issues	106

ANNEXES:

A. Application for Assistance	107
B. USAID Director's 611(e) Certification	112
C. Draft Loan Authorization	113
D. Project Description to be Used in Project Agreement	116
E. Statutory Checklist	120
F. Logical Framework Matrix	139
G. Project Performance Tracking Network	142
H. Washington Guidance re PRP Approval	143
I. Memorandum of Conversation re U.S. Vehicle Dealership	147

APPENDIX:

I.	Agricultural Research in Entente Region	149
	A. Ivory Coast	149
	B. Niger	161
	C. Upper Volta	185
II.	Sociological Research	191
	A. Social Science Research Project	191
	B. Training of African Counterpart Sociologists	192
	C. Sociological Research: Institutions and Individuals	194
III.	Entente Fund.....	195
	A. Guaranties Accorded	195
	B. Development Activities (Donor-funded)	196
IV.	Subproject Proposals	198
V.	Small Farmer Strategy for Development	201
VI.	Constraints to Small Farmer Food Production	204

LIST OF TABLES:

1.	Increase of Rural and Urban Population	3
2.	Per Capita Food Production and Imports	4
3.	Self-sufficiency of Entente Countries in Food Grains	17
4.	Production and Import of Major Cereal Crops	18
5.	Trends in Land Use for Annual Crops	21
6.	Trend in Yields of Annual Crops	22
7.	Fertilizer Consumption	23
8.	Trends in Domestic Grain Production	24
9.	Supply of Cereals, Roots, Tubers	25
10.	Technical Assistance Budget	38
11.	Subproject Analysis Framework	59
12.	Agricultural Research Network in Entente Region	62
13.	Agricultural Research Centers	63
14.	Summary of Basic Small Farmer Data	64
15.	Upper Volta: Prices and Agricultural Production	87
16.	Entente Fund: Income and Expenditure Analysis	91
17.	Entente Fund: Development Activities 1974	92
18.	Entente States: Financial Indicators	95

I. SUMMARY AND RECOMMENDATIONS

A. Borrower and Implementing Agency

The Borrower and Implementing Agency is the Mutual Aid and Guaranty Fund of the Council of the Entente, henceforth designated as the Entente Fund. The Entente Council is a political association established in 1959 by the governments of the Ivory Coast, Upper Volta, Niger and Benin (then Dahomey), and joined by the government of Togo in 1966. The Council created the Fund in 1966 as a financial institution responsible for carrying out the mandate of the Council in the field of economic development.

The Entente member governments will be the recipients of sub-loans and/or grants for the purpose of increasing the quantity and efficiency of food produced by small farmers. The implementing agencies of the member governments will be their respective Ministries of Agriculture or Rural Development in collaboration with extension services, agricultural credit institutions, marketing boards, and agricultural and sociological research institutions.

B. Amount of Assistance

Capital Development Funds	\$15,000,000
of which: Loan	(10,000,000)
Grant	(5,000,000)
Technical Assistance Grant	\$ 1,680,000

The project will finance local and foreign exchange costs of a regional food production management team and of small farmer food production projects in the Entente states. Project funds will be used primarily for local cost financing and U.S. Code 941 procurement. About 85% of project funds will be used for local cost financing. A minimum of 10% will be used for U.S. Code 941 procurement, although it is anticipated that Code 941 procurement will exceed this minimum figure. In addition, a small portion of project funds, up to 5%, or \$750,000, may be used for A.I.D. Code 935 procurement to support vehicle requirements for subprojects, and contractor services when U.S. or other Code 941 technicians cannot be identified.

Each Entente member country will contribute approximately 20% of sub-project costs. The Entente Fund will make an annual contribution from its development budget to support the technical assistance component of the project. This contribution will be a minimum of F CFA 15,000,000 or \$68,000 for the first year of the project, and may be increased thereafter.

During FY 1976, \$790,000 of the technical assistance grant will be obligated and the initial \$8,000 tranche of loan funds authorized. In FY 1977, subject to the availability of funds, the initial \$3,000,000

tranche of the grant for capital assistance, ^{will be} obligated. Subject to the availability of funds, the remaining amounts will be authorized and/or obligated in FY 1978

The Entente Fund will request AID's approval of all subprojects while still in the initial stages of project design. AID's approval will be conditioned on a positive determination that the subproject meets the eligibility criteria in Section III.D. of this paper and neither duplicates nor conflicts with other AID or other donor activities in the Entente region. In addition, for each subproject involving more than \$1,000,000 of AID loan and/or grant funds, AID will review the final proposal in terms of its economic, financial, technical, and social feasibility and give its approval before the Entente Fund obligates funds for it.

A technical assistance grant in the amount of \$1,680,000 over a three-year period will provide for a project management team, contractor services, local agricultural and sociological support for research related to subproject design and implementation, training essential for the long-term capacity of the Entente countries to plan and implement rural development projects, and the initiation of a sector assessment.

C. Terms of Loan

The Entente Fund will receive the loan for 40 years. Interest will be at a rate of 2% during the 10-year grace period, and 3% during the remaining 30 years. The Entente Member States will receive subloans from the Entente Fund at an interest rate not to exceed 3.5% during the 10-year grace period, and 3.5% during the 30-year repayment period. For exceptional subprojects which generate sufficient revenue to assure repayment over a shorter time period, the Entente Fund may set other grade and repayment periods, subject to AID approval. Those funds accruing to the Entente Fund as a result of the interest rate differential which are in excess of amounts needed to guarantee the Fund's prompt repayment to AID will be used by the Fund to continue provision of technical assistance and research and analytical support to the project.

Repayment of the loan by the Entente Fund will be in U.S. dollars, while repayment by the member states to the Entente Fund will be in CFA francs. The Borrower's repayment of the loan will be jointly and severally guaranteed by each of the five member states of the Borrower.

D. Summary Description of the Project

In view of the importance of agriculture in the economies of the Entente Member States, growth of agricultural production has been their foremost goal for economic development. Although agriculture sector policies in the past have been focussed primarily on increasing

production of cash crops which are foreign exchange earners, the Entente Member States are now giving greater emphasis to food production for domestic consumption as an important objective of sectoral development. The goal of this project reflects this new emphasis in sector activities. It is to increase the per capita production of staple food crops which are commonly produced by small farmers and consumed by the poor majority.

The purpose of the project is to assist the Entente Countries to adjust agriculture sector policies so as to enable the implementation and evaluation of a strategy of assistance to small farmers aimed at increasing the level, efficiency, and reliability of their food production. These policy changes will give greater emphasis to the regional coordination of research, systematic evaluation of small-farmer food production schemes, exchange of information, and increased provision of agricultural credit on terms which will both be appropriate for small farmers and yet provide incentives to credit institutions to institutionalize the provision of such credit.

To assist the Entente Fund and the Entente Member States to make appropriate policy changes, and to design, carry-out, and evaluate the food production subprojects which will provide the basis for testing and evaluating the strategy of assistance to small farmers for food production, AID will provide \$1,680,000 in grant technical assistance, \$5,000,000 in grant capital assistance, and \$10,000,000 in loan capital assistance. The Member States will finance 20% of the subproject costs. The Entente Fund will also make a capital contribution to the project from its development budget.

The regional nature of the project will facilitate achievement of the project purpose since both the technical aspects of food production and the administrative aspects of organizing assistance to small farmers are similar throughout the region. The Entente Fund will make a very important non-capital contribution to the project by virtue of the role it will play in coordinating the implementation of the project. The Entente Fund will be the locus of the strong, centralized project management team which will promote the acceptance of common standards for the subprojects (see Section IV.A.2 for the Subproject Analysis Framework) as well as the policy changes necessary for the success of the small farmer strategy, the efficacy of which this project is designed to demonstrate.

The institutional structure essential to the implementation of this project is largely in place. However, the institutions at the national level which deliver services to small farmers have had limited experience in food production, partly because credit has not generally been available for this sector, and partly because food production has traditionally held a position of low priority in these countries. The loan and its complementary technical assistance grant

will expand both the technical and the long-term capacity of these institutions to serve the small farmer's food production needs, and will encourage complementary institutions in agricultural and sociological research to develop skills relevant to small farmer food production problems.

E. View of A.I.D. and U.S. Missions

The project is recommended by REDSO/WA, the Regional Development Office in Niamey, AID representatives in Upper Volta, Togo and Benin, and the U.S. Embassies in the five Entente countries.

F. Certification of Mission Director

The Mission Director, having taken into consideration the requirements for additional resources to promote the development of the domestic food production sector in the Entente nations, certifies that the Entente Fund and its member nations have the technical, institutional, and human resource capacity to utilize effectively this capital assistance project. See Annex B.

G. Statutory Criteria

The project meets all relevant requirements. See Annex E.

H. Issues: None

I. Recommendation

On the basis of the analyses contained in this Project Paper, the Project Committee recommends approval at this time of the entire loan/grant project as it is described herein. The Project Committee also recommends authorization of the \$8,000,000 tranche of loan funds in FY 1976 and, subject to the future availability of funds, an additional tranche of \$2,000,000 in FY 1978 for a life-of-project total of \$10,000,000 in loan funds. The Project Committee further recommends obligation of the initial \$790,000 tranche of grant funds for technical assistance in FY 1976, and subject to the future availability of funds, obligation of an additional \$890,000 in FY 1978 for a life-of-project total of \$1,680,000 in grant technical assistance. Finally, the Project Committee recommends, subject to the future availability of funds, obligation for the initial \$3,000,000 tranche of the capital assistance grant in FY 1977 with the remaining \$2,000,000 to be obligated in FY 1978 for a life-of-project total of \$5,000,000 in grant capital assistance.

The loan funds will be used primarily in the Ivory Coast, Togo, and Benin. The capital grant will be used primarily in Upper

Volta and Niger (See Section III.C.1 for details of the proposed distribution of capital funds). The technical assistance grant will provide training, subproject design and evaluation, research, and other technical support critical to the attainment of project objectives.

The need for these funds to reverse the trend of declining per capita food production has been demonstrated in Section II.A.3 of the Project Paper. The capacity of the Entente Fund and its member nations to implement the project is evidenced in Section IV.c. The Project Committee is satisfied that the utilization of the loan and grant funds will contribute to the reversal of the declining food production trend in the Entente countries.

Project Paper Team: Helen Soos, AFR/DS
Charles Blankstein, TA/RD
Todd Crawford, REDSO/WA
Morgan Gilbert, REDSO/WA
James Phippard, REDSO/WA
Willford Morris, Consultant
Fred Derafols, Consultant
Jacques Gurgand, Entente Fund

Drafted by AFR/DS, Helen Soos; TA/RD, Charles Blankstein; Todd Crawford, REDSO/WA; and Consultants William Morris and Fred Derafols

II. PROJECT BACKGROUND

A. Agricultural Evolution of Entente States

In precolonial times the people of what are now the Entente States were subsistence farmers, subject to wars, slavery, diseases, and pestilence. Colonial times brought an end to wars and slavery and the rudiments of a public health system to protect against the great epidemic diseases, which were a threat to all including the colonial administrators. At the same time as these factors reduced mortality, new lands were opened up by farmers.

The tribal societies had a defense against drought in the form of traditional grain storage of unthreshed grain and a social system controlling its use.

The increase in population and the increase in the area planted to cash crops, mainly peanuts in the regions of Niger and Upper Volta affected by the drought, have overburdened the soil resource of the region. This led to a progressive shortening and, in some areas, elimination of the bush fallow, with a consequent decline in fertility. ^{1/}
(See Table 1 on page 3).

The trend continued unchecked after independence. Its effects can be clearly seen in the Mossi Plateau and in the Maradi and Zinder areas in Niger. The reaction to the effect was an outmigration of people to areas where they could (or thought they could) make a better living. During the late 1950's and most of the 1960's, this resulted in opening up of land north of the traditional northward limit cultivations, made feasible by the favorable rainfall and, on the other hand, the outmigration of young people and subsequently families to the coastal countries. The northward migration was abruptly reversed by the drought: several years of below average rainfall, in areas traditionally with a highly variable rainfall, left the population with a very serious lack of food supplies.

Meanwhile, urbanization was also taking place in the region. Hence the fraction of the population not engaging in agriculture, although small (except in Benin) increased much more rapidly than the rural population. However, agricultural prices and the price elasticity for food grains have traditionally encouraged farmers to cover their own family subsistence needs with a 10-20% margin of safety and then to produce cash crops (mainly peanuts and cotton) with their remaining resources of labor and land. In this way the farming sector has not increased its production to take care of the increasing urban demand. (See Table 2).

^{1/} The most obvious example in the West African Region is the Moyon Bassin peanut area in Senegal.

The relative decline of per capita food production is partly caused by agricultural price policies which fail to "transmit" the increasing demand to the producer through price signals. National policies favored the maintenance of low retail food prices in order to keep down the cost of living. Elliot Berg ^{2/} points out that in francophone Africa, there is relatively little appreciation of the broad "signalling" or allocative effects of prices. Meanwhile, the quantities of wheat, a grain that cannot be widely grown in the region, that are imported and sold at subsidized prices, continues to increase.

The post-independence policy of keeping food prices low in urban areas stemmed from the political power of the urban elite and has resulted in subsidies for imported grain such as rice and wheat, as well as for low producer prices for domestically produced grain. Price policy generally effected a subsidization of the urban consumer by the farmer, or an implicit taxation of the rural sector. There are signs that food price policies are beginning to shift in the area. In the Ivory Coast, for example, price policy has been initiated to encourage the production of rice. In 1974, the producer price of rice was increased over 100% to 75 FCFA per kilo. The consumer price also increased from 60 FCFA to 125 FCFA per kilo, inducing a decline in the demand for rice nearly 50%. But production rose so sharply that SODERIZ, the semi-autonomous rice marketing company, appears to have a surplus on hand, and imports of rice have ceased. Probably the price increase was excessive, surpassing the equilibrium price of rice, but the truly dramatic response indicates that price policies do affect domestic demand and production. A similar response on the production side of equation obtained in Niger last year when producer prices for millet and sorghum were increased. Thus the policy of subsidizing urban food prices is beginning to shift in favor of higher producer prices, largely because the drought accentuated the trend of deficit domestic food production and growing food import bills, especially as world inflation struck cereal prices and other food prices.

^{2/} Berg, E., The Recent Economic Evaluation of the Sahel. CRED, University of Michigan, 1975. p. 102.

TABLE 1.

Rate of Increase of Urban and Rural Population in the 1960's
(FAO (Agricultural) Production Yearbook 1973*)

		1960	1970	Percent Change
		Population 000's		
Benin	Total	2113	2686	29.1
	Rural	1152	1405	22.0
	Urban	961	1281	33.3
Ivory Coast	Total	3433	4310	25.5
	Rural	3047	3495	14.9
	Urban	386	815	211.1
Niger	Total	2913	3848	32.1
	Rural	2773	3517	26.8
	Urban	140	331	236.4
Togo	Total	1465	1861	29.0
	Rural	1166	1394	19.6
	Urban	299	467	56.2
Upper Volta	Total	4400	5376	22.2
	Rural	4026	4774	18.6
	Urban	394	502	52.8

* There are disparities between estimates of population. The estimates are based on applying a rate of change to a base line figure. However, the trend can be shown from these data, even if they are not absolutely accurate.

TABLE 2

Per Capita Food Production and Imports in Entente States
(kilo grams per person)

	People/ Cropped Hectare	Pop. Growth Rate	1961	1965	1970	1973	Caloric Intake as % Require ^{3/} t
Benin	<u>1/</u> 1.8	2.2%					98%
All Grains			135	124	114	93	
Maize			102	95	92	75	
Grain Imports <u>2/</u>			3.4	5.7	7.4	4.2	
Ivory Coast	0.6	2.8%					108%
All Grains			74	106	108	122	
Rice			74	67	75	88	
Maize			15	24	22	24	
Grain Imports			25	38	44	65	
Togo	0.9	2.9%					94%
All Grains			85	139	125	78	
Maize			45	45	50	27	
Sorghum/Millet			32	80	65	45	
Grain Imports			3.4	5.6	9.4	10	
Niger	0.3	3.0%					93%
All Grains			264	255	259	150	
Sorghum			92	81	76	49	
Millet			108	170	161	98	
Grain Imports			1.2	1.8	3.2	16.5	
Upper Volta	1.0	2.1%					82%
All Grains			161	215	191	146	
Sorghum			91	110	70	84	
Millet			43	73	70	44	
Grain Imports			1.8	3.1	5.7	12.5	

Source: The data were derived from FAO production and import statistics and U.N. population statistics.

1/ All grains includes rice, maize, sorghum, and millet.

2/ Grain imports are virtually limited to wheat and rice, for all countries.

3/ 1970, FAO data.

It should also be noted that the higher the proportion of the crops sold off the farm, the more rapidly the soil will be impoverished unless fertilizers are added. In Niger for cotton and peanuts and in Upper Volta for peanuts, relatively little, if any, fertilizer is used.

1. Agricultural Policy

Colonial governments have been accused of encouraging the production of export crops to the detriment of food crop production and of neglecting research on food crops while pursuing research on export crops with such organizations as IFAC, IRCT, IRCC, and IRHO (all created in 1942) and even IRAT ^{3/} (created in 1960). However, IRAT, created at the time of independence of the colonies with the objective of studying food crop production and general agronomic problems, has, under a regional research system, studied millet, sorghum and maize in the region at Bambey (Senegal), Saria (Upper Volta) and Bouake (Ivory Coast) respectively. Rice production has also been studied.

Although it is interesting to know the maximum yield which can be obtained from a seed strain with heavy fertilizer application, IRAT in the region can be criticized for having devoted too much research to yield maximization and too little to an economic optimization based on the cost of factors of production and inputs. However, there is evidence that high fertilizer prices and balance of trade difficulties are causing a change, if not abandonment, of this "high fertilizer input" concept. IRAT could also be criticized for being slow in many countries to test the varieties made available through the network of International Centers, available through the JP 26 program, from U.S. Centers and now from ICRYSAT. ^{4/} The recent ICRYSAT outreach program promotes a close liaison between the IRAT regional sorghum and millet programs and the international centers.

The French sponsored export crop research stations had close associations with semi-autonomous development societies or operations:

- IRCT with CFDT (Compagnie Francaise de Developpement des Textiles) and now its successors on a national basis.
- IRHO and also IRAT with peanut operations.

^{3/} Respectively the

French Institutes for Overseas Fruit Research,
Institute for Research on Cotton and Exotic Textiles
Institute for Research on Coffee and Cocoa
Institute for Research in Oils and Oil Crops, and
Institute of Tropical Agronomic Research.

^{4/} International Center for Research on the Semi-Arid Tropics, Hyderabad, India

The development programs of francophone Africa were single export crop oriented. This was the only basis on which they could become self-supporting, with monopolistic marketing systems permitting levying a tax to pay the costs. The assumption was also made that only cash crop production could repay the cost of inputs and that somehow there would be a transfer from an increase in production of cash crops to an increase in the production of food grains. However, this occurred only on a very limited scale, from use of the residual fertilizer (from cotton, for example) and to an even smaller extent from the divergence of subsidized cotton fertilizer directly to food grains.

The linkage between IRAT and the farmers was left open in the organization system, whereas the other crop research institutes were closely tied with the extension operations. In Upper Volta, under AID sponsorship, IRAT has moved into the void with responsibility for some local trials and multiplication of elite seed. Thus the possibility exists for IRAT's results to be disseminated through the extension operations. However, under the IRAT charter this is not done unless specific arrangements are made.

Single crop development operations have now mostly been changed to have a multiple crop emphasis, including food grains. However, although the technical package of a more productive food grain -- in terms of both yield per hectare, at an economically feasible level of fertilizer application, and production per man-day of labor required -- probably exists for maize and certainly for rice, work to develop it for the sorghum-millet area has been limited and the results not widely disseminated. Any emphasis on sorghum and millet in the Sahelo-Sudanian subprojects must therefore await the further development, demonstration, and dissemination of the technical package.

Although there is conclusive evidence of a change in the policy concerning research on food grains, and in the policy of extension to include food grains, which can be expected to lead to effective technical packages, the full impact of these changes are likely to lag unless there is a change in the price policy. With a small change in price policy, some areas may be found in which sorghum and maize production may be profitable over time as a cash crop. At present, this tends to be the case only when prices get out of line with the government's proposed prices.

2. Soil Fertility

Traditional systems of production within the area tend to involve at least part of the land in fallow due to an inability to maintain fertility on a sufficient area of permanent field. Close to the concession there is usually a garden, which gets manured with

household residues. There may be a "manured" field a little further away, which gets annual application of animal manure. Even further away, sometimes several kilometers, are the slash and burn fields. These fields, with their long fallows, contribute to maintain the fertility of the fields closer to the house by providing food for the family and producing waste for fertilizing the fields close by.

The bush land rotation in drier areas may be obtained in continuous cultivation, but by planting in a different spot each year, for example with millet hills 2 meters apart. A hill does not return to the same point for many years.

As population pressure increases, the demand for land to crop shortens the fallow. There may come a time when the fallow is too short to maintain the level of fertility in the system. Also, as the percentage of the crop produced that is sold increases, unless fertilizer is introduced, the soil fertility may start to decline.

In terms of nutrients, the region is short first and foremost in phosphate. Rainfed crops typically do not respond much to nitrogen unless phosphate is also applied. Local supplies of rock phosphate simply ground have been shown to be an effective source of phosphate, sometimes with a delay of 1 to 3 years due to slow absorptive action. In zones with rainfall under 500 mm, the results are erratic. After several years, especially if the stalks are removed, potash deficiencies can arise. Nitrogen can to some extent be replaced by fixation from the air in the soil by nodules on the roots of legumes and some other plants. So the depletion of nitrogen can be retarded by crop rotations. Thus phosphate remains the key in the maintenance of soil fertility.

Fortunately, there are well proven deposits of rock phosphate in the area where Upper Volta, Niger, and Benin are adjacent, near the national parks of Arly, W, and Pendjari. There are also deposits, perhaps including beds of coprolytes, at Tahoua in Niger. The exploitation of these deposits on an artisan basis is an urgent matter for the maintenance and restoration of fertility in the soils. However, it must be remembered that provision of phosphate will only "buy time" especially in the areas with a dense population in relation to resources. After 5-10 years of profiting from the use of phosphates, another factor will become limiting in the maintenance of soil fertility -- perhaps potash.

The Effect of the Drought on Agriculture
and Agricultural Policy

The drought with several poor harvest in a series affected the crop production in the Sudano-sahelian area (450-750 mm/year average rainfall) in two different ways: (1) The quantity of livestock that could be kept declined -- due to decline in savings available from the sale of cash crops -- with a consequent decline in the manure available for application to the manured fields (Karkara). This led to a decline in yield in addition to that due to the lower rainfall. (2) The need to try to increase food crop production to compensate for the lower yields, resulted in planting on the traditional fallows before they had recuperated. This also gave depressed yields beyond what might be expected to result from the rainfall.

Both of these practices accelerated the decline in soil fertility. As the farmers in Niger encountered a bottleneck in the labor supply during the cropping season, they reduced the area in peanuts. Raynaut^{4/} reported the 1974 crop of peanuts sold was 15,000t (shelled), compared with 182,000t in 1968 and 27,000 in 1929! The smaller area devoted to the production of cotton was better maintained. Peanut production tends to be found in areas with lower average rainfall than cotton, and so in areas worse hit by the drought.

In Upper Volta the increase in the price of sorghum in the West in 1973, where cotton is grown, caused sorghum production to bring a higher return per man day than cotton. This resulted in a shift out of cotton and into sorghum in the West. Overall, the area in cotton increased.

Another significant change occurred in the zones where the herders and the farmers interact, the traditional exchange rate of a measure of milk for a measure of grain broke down. The terms changed in favor of the farmers as the supply of cereals declined and as it became difficult for herders to keep the livestock alive. So the forced sale on different terms caused a transfer of wealth, in the form of livestock, to the farmers.

^{4/} Raynaut, Claude. Le Cas de la Region de Maradi, Niger in Copans, J. Editor. Secheresses et Famines du Sahel, Vol. II, P. 17. Maspero, Paris, 1975

The farming zones which suffered the most were the zones north of the traditional limit of cultivation, which had been settled by the excess population during the period 1954-1968 with higher than average rainfall. The period 1969-1973 was typified not just by a lower average rainfall but also by fewer days of rain, with longer gaps between them. The area cropped decreased.

Grain reserves held unthreshed by the farmers became exhausted and the merchants and governments did not have reserves of threshed grains. In any case, the quantity marketed, probably 10-15% ^{5/} of the crop, on average is not sufficient to provide for urban needs and to accumulate a significant reserve. A decline in yield of 10%, even with "belt tightening" by the farm families, without adequate reserves could easily halve the amount available for sale. Declines in yield of 15-40% ^{6/} three years in succession clearly lead to famine in the rural areas as well as wiping out the surplus available for marketing.

In Niger this was accompanied by an even greater decline in the rice crop, in from 37,000t average in 1967-70 to 27,000 in 1971; 15,000 in 1972; and 12,000 in 1973. This was caused by near failure of floating and rooted crops in the cuvettes along the Niger due to erratic and inadequate flood crests of the river.

The agricultural policy of the five entente states was, of necessity, widely different. All had three common elements:

- to strive for self sufficiency in food grains and to a lesser extent rice,
- to stimulate the production of export crops, particularly cotton in the higher rainfall areas and peanuts in the drier areas,
- along with these to try to maintain low prices of food grains and to "tax" the farmer by maintaining a wide gap between the producer price and the export price of cotton and peanuts.^{7/}

The Ivory coast placed development priority on the export crop production in the forest zone. Only recently has a priority been given to develop agriculture in the north, a region which in the last 5-10 years has actually declined in population. Production of maize for animal feed has also recently become an objective of agricultural policy.

^{5/} SEDES in 1963 estimated that only 10% of the Niger food grain crop was marketed.

^{6/} Niger's 1971 cereal production was 93% of the average 1967-70; in 1972 it was 81%; in 1973, 65%; and 1974, 86%

^{7/} In 1971/72 SONORA in Niger showed a balance of income over costs of cfa 1,655 millions-\$7.5-8 million, 48% on the turnover and greater than the cost of import of all foods in 1972.

Upper Volta has accepted U.S. AID assistance with food grain production, particularly in variety selection and seed multiplication. Development programs have given priorities to use of fertilizer, animal traction, and government intervention in the grain trade. In the past GOUV has had a very successful program in the promotion of seed dressing to protect against fungi and insects and a less successful program on the protection of stored grain.

Niger, until the recent signing of the AID millet program, has given priority to the production of export crops and of rice.

Under stimulus from the IBRD, Dahomey is introducing a food grain production element in the IBRD rural development project in conjunction with the production of export crops.

Government priorities have not generally been directed towards the development and demonstration of the technical package to increase the productivity of food grain production and have been directed at maintaining a supply of low priced food grains in the urban centers, which tends to depress the production of a market surplus.

It is only fair to say that it is not clear that improved technology in food grain production would increase the market surplus, but it would increase farmer income and permit production of more export crops. Also, with the pressure for donors on projects becoming self-supporting, it is easy to see how this can be done with a successful program in export crop production -- with government control of export -- and difficult to see how it can be done with a food crop program, except indirectly by releasing more foreign exchange resources to export crops.

The drought has impressed on the Sahelian countries the need for national food grain reserves stored in places where they will be needed. Donors have funded the construction of the storages. However, it is technically difficult for governments, which have not traditionally been substantial grain dealers, to buy grain, assemble it, grade it in an upgraded market, store it in good condition, and turn over the stocks so that when the emergency arises the quality will be satisfactory.

The drought has also demonstrated that urban populations will, if forced to, pay more for domestic food grains, often with a reduction in the expenditure on the ingredients of the sauce (e.g., lowering meat consumption). Furthermore, at the higher price which obtain during periods of scarcity, food grain can become more profitable per man day of work than export crops, a fact that has been recognized by farmers.

The rapid increase in fertilizer prices, with the consequent drain on the foreign exchange of the Stabilisation Funds to maintain the subsidized price, has convinced the governments and their French advisors that a policy to increase food grain production by massive application of fertilizers is not the desirable solution and that search should be made for other means of increasing production of food grains.

In the Ivory Coast governmental increase in price of rice from 60f to 125f/kg at retail was observed to depress greatly its consumption, presumably causing the consumers to substitute with other cereals or root crops. This indicates that demand for imports when world prices are high (they went over 125f/kg, but declined by October 1975 to about 80f/kg) will decline if the African consumer is exposed to the world price. It also showed that domestic production was greatly stimulated and that import savings took place by consumers substituting domestic products for imported rice.

Food Crop Production, Absolute Level and Self-sufficiency^{1/}

The level of food crop production can be seen in two ways:

- a. The calories and protein provided per capita per day, compared to realistic standards.
- b. The national food balance that is production -- export and import.

However, there are many problems in obtaining estimates of these two measures. FAO production and trade statistics, although useful, are not precise where much of the crop does not pass through the market but is consumed by the producers. There is doubt about some dual purpose crops like peanuts, which are both exported and consumed in the local diet, both by producers and through the markets. Furthermore, the frontiers are permeable and crops flow across them. For example, many of the peanuts exported in Sonora (Niger) sacks are Nigerian in origin, purchased directly or indirectly or with currency provided from the sale of Niger cattle. Benin is also known to export maize to Nigeria.

Judged by the energy level in 1970, only Upper Volta was seriously below the recommended level at 82% of the norm. (See Table 9). Togo and Benin are short of protein. However, there was no "slack" or cushion when production fell in 1971 in the Sahelian countries.

^{1/} See Tables 3 to 9 at end of this section for supportive data from which this discussion was drawn.

On a self sufficiency basis up to 1970, the situation in Upper Volta and Niger was good, producing an apparent 90% of the supply. The problem was mainly an increasing demand for wheat with little (Niger) and no (Upper Volta) capacity to produce it. Evidence shows that the demand is wide spread and not just centered in the cities. In some countries, the wheat flour is being mixed with sorghum flour to diminish the need for import. In any case, a figure of 2 1/2 kg/capita imported is not a very serious item, but the trend to double every 5 years cannot be ignored.

In Togo and Dahomey the insufficiency is about three times as great and includes a substantial amount of rice. The wheat imports doubled each 5 years while the rice import was relatively unchanged.

The Ivory Coast is obviously a special case, with about half of the land use in tree crops (coffee, cocoa, rubber, palms, and coconuts) she imports 22-24% of her cereal needs in normal year. This has, in part, been the result of a priority to develop export tree crop production in the forest zone, neglecting the needs of the Sudano-Guinean grain producing zone. With improved maize storage, and with driers accessible at harvest time, it is probable that much more maize would be produced for human as well as livestock needs. As has been mentioned earlier, if the imports are not subsidized and domestically produced rice can be sold at the same price as imported, rice imports would decline; the higher price would reduce consumption and stimulate local production.

With 18.3 kg/capita imported wheat in 1966-70, only up 28% on 1961-65, Ivory Coast enjoys 3 1/2 times the per capita wheat consumption of Togo or Dahomey.

Effect of the Drought

The effect of the drought was different in each country. The Ivory Coast shows a considerable increase in imports, especially in 1973, of about 166,000 tons more than in 1972. This was made up of 44,000 tons of sorghum, 57,000 tons of rice, 65,400 tons of wheat over 1972 imports. Domestic production in the Ivory Coast in 1973 increased 37,000 tons over 1972, mainly in rice; so that the total supply, including imports, was 30% higher than in 1972. It is almost certain that a substantial part of the importation was reexported to Mali, Upper Volta, and, to a lesser extent, Niger as drought relief. No correction has been made to the Voltaic and Nigerian figures for imports. The imports into Dahomey in 1973 were nominal and unlikely to include a similar error.

However, even in the Ivory Coast, where the national food supply showed no appreciable decline in either rice, or sorghum/millet or maize and showed an increase in wheat, it is quite possible that the subsistence farm families in some localities in the north suffered a decline in their caloric intake due to local declines in yield. This is probably more true in Togo, with a larger portion of sudanian climate. For analysis by country, it is possible to combine cereals and roots and tubers into a common measure and this tends to obscure the fact that some groups eat a cereal based diet with little or no roots and others the reverse.

In Dahomey the the cereal supply declined 23.6% and the roots/tubers 21.1% in 1973 compared with 1966-70. The cereal supply is not corrected for clan-destine export or maize to Nigeria. The sorghum/millet supply was down almost 40% and apart from a substantial increase in wheat import in 1972, there is no indication of how the people in the north managed to supplement their diminished cereal supply.

In Togo the sorghum/millet supply in 1973 was reduced 26% (on 1966-70) and the maize supply by 44.5%. Quantities of cereals imported changed very little in the 1970's. Here again, in a country which had an average initial level of caloric intake 6% below the norm, the decline in supply--here not only for sorghum/millet eaters but also for maize eaters--must have caused real distress.

Upper Volta started, according to the FAO statistics, with a much lower level of caloric intake than any of the other countries--82% of the norm. Roots and tubers are relatively insignificant. Maize production declined by 42% in 1973 (1966-70 base period) while sorghum/millet declined by 20% (14% for sorghum and 29% for millet). There was an average decline of 20% in the cereals supply per capita, corrected for increase in population. The more than half of the decline in maize production was made up by increased imports, but only about 20% of the sorghum deficit and almost none of the millet were made up by imports. Here again the whole level of nutrition declined but the effect was certainly more felt in the north.

In Niger the problems of declines in yields were compounded with a decline of acreage of 31% in millet and of 26% in sorghum, making 29% in total cereal acreage. A similar reduction took place in the acreage of peanuts. This reduction, which mainly took place in 1973, is believed to be caused by poor yields in 1971 and 1972 among the producers who had moved northwards in the 1954-1968 series of years with favorable weather.

The decline of 590,000 ha (29%) in cultivation, probably caused a displacement of almost 250,000 farm workers 1/ which would be 22.5% of the workers. In Niger the average ratio of economically active total population in agriculture is 1:3.16. So about 750,000 people may have been involved. This may be an over-estimate because it assumes that farm families on the entire 590,000 ha moved from their farms. In fact, part of the decline in area farmed may have been by farmers abandoning marginal fields while continuing to farm their better (with higher moisture availability) land.

The ecological damage caused by destroying the vegetative cover from this marginal crop land, and the corresponding area in fallow, and abandoning it in a drought, is enormous. Not only is the land very slow to generate new cover and susceptible to erosion in the meanwhile, but the pastoralists lose the value of the pasture present in the initial state of the land.

Meanwhile, the average yields of sorghum and millet showed only modest declines, according to the FAO statistics, presumably because much of the marginal land was abandoned.

The per capita supply of cereals and of total cereal equivalent declined by a third. The increase in reported imports in 1973 amounted to 6% of the 1966-70 average production, compared with a 33% decline in the total supply. It would, of course, have been impossible to have brought in the 250,000 ton deficit; the quantity reported as imported in the 1973 was 67,000 tons.

Explanation underlying these trends are numerous and inter-related. First, increased urbanization has decreased the proportion of subsistence producers. Secondly, domestic production prices for food have been too low to induce production of food grains as cash crop. The policy of subsidizing urban consumer prices has prevented market forces from pushing up the producer price of food grains. Thirdly, even where price incentives have begun to appear, the marketing infrastructure is too weak to support the transfer of sufficient increases in domestic production to satisfy urban markets. The recent creation of government marketing boards for food grains is creating problems in most Entente countries and will probably never solve the marketing problem for domestic cereal crops. In Upper Volta and Niger, the marketing boards have insufficient funds and storage facilities to buy the produce of the small farmer at the guaranteed price. Therefore, left to free market forces, the thin market in food grains can cause prices to drop drastically after the harvest season, and little price incentive remains for the small farmer unless he possesses storage

1/ In the millet zone, 1 worker "cultivates" about 2 ha and 1 worker supports an average of 3.16 people.

facilities. Even then, his venture is highly speculative, as he does not know what price he will receive. Finally, consumer tastes tend to change with urbanization. Rice and wheat tend to be consumed by urban dwellers, all the more so when prices of these imported foods are subsidized. A serious question with respect to these imports is the extent to which these consumer preferences will "erode" when prices are allowed to rise. Recent experience in Ivory Coast shows that the demand for rice fell by nearly 50% when rice prices rose. Therefore, there may be considerable room for the substitution of domestic food grains for imported rice and wheat. Furthermore, rice production is feasible in each of the Entente states, and wheat production is a potentially important crop in Niger during the dry season, in rotation with rice.

Clearly, the declining per capita food production trend has serious implications for the development of the Entente nations. As world inflation continues, the food deficit will represent an increasingly large drain on scarce foreign exchange resources. With proper pricing policies and development projects, the Entente countries are capable of achieving self-sufficiency in most food crops, wheat in the coastal countries being the major exception. Therefore, the purpose of this project is to reverse the trend of food deficits in the Entente Region.

Conclusions

The most important lessons that can be drawn from this limited review with FAO data of limited reliability are:

1. Togo and Dahomey have vulnerable grain eating populations and need to attempt to reduce their drought susceptibility.
2. Expansion of subsistence millet production in areas known by governments to have an average insufficient rainfall leads to disaster for the settlers themselves, for the ecology, and at the same time denies pasture to the pastoralists.
3. The Sahelian countries badly need some more drought resistant varieties of millet and, to a lesser extent, sorghum. In fact, the need for both may be about equal because areas now in lower yielding millet would give higher yields in drought resistant sorghum, i.e., sorghum yields are generally significantly higher than millet yields. Drought resistance is found in shorter season varieties and in some varieties that use a limited water supply more effectively.
4. Any measure that can raise yields (e.g., rock phosphate application) will give more time to regulate the problem of excessive population for the natural resources, which was the cause of the migration northwards and the flight southwards in Niger, and the migration southwards by the Mossi in Upper Volta. Such measures only buy time in which to resolve the problem.

5. It appears that land use in peanuts in Niger and Upper Volta had expanded during the favorable rainfall years (1954-1968) to a level that could not be sustained. It is not clear the extent to which mixed cropping with cereals takes place. A higher yielding peanut variety would help to restore the cash crop income in the peanut areas. Farmers should not be encouraged to divert more area out of food crops. In Niger the area in pluses (niebe), probably grown in association with cereals, is very high (has been almost 2 million ha). This crop, which adds to the local diet* and serves as a cash crop, needs a serious effort on its improvement.
6. The area in cotton was maintained or increased during the drought. It is less extensive than peanuts and is grown in areas with higher rainfall and so does not appear to be so competitive for land which would otherwise be in food crops, in areas that are densely populated in relation to their resources.
7. Agricultural research, demonstration and testing needs to be intensified to provide improved drought resistant varieties, of acceptable appearance and quality. Advantages gained by these improved inputs will only last for a relatively short time and a continuous flow of production increasing technologies will be needed to take care of the increasing populations with an acceptable level of drought risk.
8. The traditional defense against drought, storage of considerable quantities (a year's supply) of unthreshed grain on the farms, should be studied and, if possible, improved. This comprises the best method of drought relief: storing the reserves and maintaining their quality, in the place where they are needed. Storage of the threshed grain, which is much more difficult to maintain its quality, also needs to be studied but is likely to be inferior in results to storage of unthreshed grain.
9. Urban area storage of large relief stocks produced domestically will be difficult to accomplish without loss in quality. The total storage need is for probably one year's supply. Problems of building up the stock and turning over the stock, when only 10-20% of the crop is marketed, present almost insuperable problems.
10. Price movements during the drought indicated that farmers are willing to grow and market more food grain at certain price levels (probably in relation to opportunities with export crops) and that there is substitution of imported crops by domestic crops if the price relationship reaches a certain level.

TABLE 3

Self Sufficiency of Entente Countries in Food Grains
1961-65, 1966-70, 1971-73

	1961-65			1966-70			1971-73			1971-73 as % 1966 — 1970
	Pro- duc- tion	Import	Total	Pro- duc- tion	Import	Total	Pro- duc- tion	Import	Total	Total
<u>Benin</u>										
000t	287.0	9.7	296.7	286.6	17.4	304.0	282.0	22.2	304.2	
%	96.7	3.3	100.0	94.3	5.7	100.0	92.7	7.3	100.0	100.0
<u>Ivory Coast</u>										
000t	349.8	103.1	457.9	480.8	137.7	618.5	506.6	194.8	701.5	
%	76.4	23.6	100.0	77.7	22.3	100.0	72.5	27.5	100.0	113.4
<u>Niger</u>										
000t	844.2	4.8	849.0	929.2	9.9	939.1	733.0	29.7	762.7	
%	99.4	0.56	100.0	99.0	1.05	100.0	96.1	3.9	100.0	81.2
<u>Togo</u>										
000t	200.4	15.2	215.6	286.6	13.1	299.7	230.0	19.3	249.3	
%	93.0	7.0	100.0	95.7	4.3	100.0	92.3	7.7	100.0	83.2
<u>Upper Volta</u>										
000t	956.4	10.6	967.0	1057.4	13.1	1060.5	861.3	56.5	917.8	
%	98.9	1.1	100.0	98.8	1.2	100.0	93.8	6.2	100.0	86.5

Per Capita Imports of Food Grains, kg.

	1965-70				1973
	Wheat	Rice	Other	Total	Total
Benin	3.7	2.2	0.5	6.5	8.3
Ivory Coast	18.0	13.4	0.5	31.9	45.2
Niger	1.3	0.1	1.1	2.6	7.7
Togo	5.5	1.4	0.1	7.0	10.4
Upper Volta	1.9	0.5	0.0	2.4	10.5

TABLE 4

Production and Import of Major Cereal Crops
1966-70 and 1970, 1973

<u>Benin</u>	1966-70	1970	1971	1972	1973	1974
<u>Rice</u>						
production	4	10	5	5	5	6
import	6	43	75	30	20	
supply	10	53	80	35	25	
* <u>Maize</u>						
production	219	224	175	207	200	310
import	4					
supply	223	224	175	207	200	310
<u>Sorghum/millet</u>						
production	61	48	55	56	95	82
import						
supply	61	48	55	56	95	82
<u>Wheat</u>						
import	10.1	11.0	16.5	28.3	9.2	
<u>Total</u>						
production	284	285	238	269	340	400
import	17.4	15	24	31	11	
supply	301	300	262	300	340	
		100%	87%	100%	85%	
<u>Ivory Coast</u>						
<u>Wheat</u>						
import	78	100.9	32.2	76.4	141.8	
<u>Rice</u>						
production	321	316	385	320	335	380
import	58	78.8	97.2	88.0	145.0	
supply	379	395	482	448	545	
<u>Maize</u>						
production	129	92	112	113	116	130
import	2.2	4.6	1.6	2.4	2.4	
supply	131	97	114	110	110	
<u>Sorghum/millet</u>						
production	46	43	45	45	46	58
import	3.2	5.0	5.0	6.0	50.0	
supply	49.2	48	50	51	96	
<u>Total</u>						
production	496	453	543	480	497	568
import	138	184.3	131.2	171.8	339.2	
supply	634	637	674	652	836	
		100.0%	100.5%	102.8%	132.0%	

*Maize export from Benin to Nigeria is unreported,
but usually important.

TABLE 4 (cont.)

Production and Import of Major cereal Crops (continued)

<u>Niger</u>	1966-70	1970	1971	1972	1973	1974
Wheat						
production	1	1	1	1	1	
import	.6	3.1	1.0	5.2	5.0	
supply	1.6	4.1	2	6.2	6.0	
Rice						
production	34	37	27	32	46	43
import	5.8	.1	.1	.1	1	
supply	40	37	27	32.1	46.1	
Maize						
production	2	2	2	2	3	3
import	.1	0	0	0	12	
supply	2	2	2	2	15	
Sorghum/millet						
production	893	947	850	710	525	800
import	3.2	5	5	6	50	
supply	896	952	855	716	575	
All cereals						
production	930	986	880	744	575	847
import	10.0	12.0	9.9	11.6	67.6	
supply	940	998	890	755.6	642.6	
<hr/>						
<u>Togo</u>						
Wheat						
production						
import	10.3	15.1	14.0	14.3	12.5	
supply						
Maize						
production	108	100	80	76	60	80
import	.1	.6	.4	1.4	2.0	
supply	108	101	80	77	62	
Sorghum/millet						
production	157	130	100	151	130	140
import	0		1.7	0.2	0.2	
supply	157		101	151.2	130.2	
Rice						
production	19	18	24	15	10	
import	2.7	3.1	1.0	5.2	5.0	
supply	21.7	21.1	25	20	15	
All Cereals						
production	284	250	208	244	202	238
import	13.1	18.8	17	21	20	
supply	287	269	225	265	222	

TABLE 4 (cont.)

Production and Import of Major Cereal Crops (continued)

<u>Upper Volta</u>	1966-70	1970	1971	1972	1973	1974
Wheat						
import	20	29	28	23	25	
Rice						
production	37	34	36	30	32	25
imports	2.7	2.6	1.3	1.6	1.0	
supply	39.7	36.6	37.3	31.6	33.0	
Maize						
production	100	55	66	60	58	50
imports	1.1	0.4	14.0	5.0	23.0	
supply	101.1	55.4	80.0	65.0	81.0	
Sorghum/Millet						
production	913	941	770	778	734	620
imports	0.7		20.0	6.0	22.0	
supply	913.7	941	790.0	784.0	756.0	
Total						
production	1050	1032	881	872	831	699
imports	25	31.9	62.9	35.3	71.4	
supply	1075	1063.9	943.9	907.3	902.4	
	100.0%	99.0%	89.0%	84.0%	84.0%	

TABLE 5

Trends in Land Use for Annual Crops (from FAO data) 000 ha

	1948-52	1952-56 *	1961-65	1966-70	1971-74	1971	1972	1973	1974
<u>Nenin</u>									
Cereals	476	469	544	556	478	447	481	497	488
Roots/tubers	227	250	269	191	160	175	154	172	173
Pulses	109	114	90	80	76	82	78	65	81
Peanuts	35	45	75	77	84	85	83	83	87
Cotton**	59	55	27	36	50	56	47	46	50
Total	912	939	1011	946	848	845	846	866	879
<u>Ivory Coast</u>									
Cereals	457	414	473	600	555	543	546	557	574
Roots/tubers	296	293	367	537	569	563	571	566	576
Pulses	14	14	30	22	22	22	22	22	22
Peanuts	34	27	44	47	50	51	51	50	50
Cotton	64	102	48	52	63	58	65	65	65
Total**	875	860	972	1272	1259	1251	1255	1260	1287
<u>Niger</u>									
Cereals	1478	1524	1818	2028	1815	1990	1943	1476	1927
Roots/tubers	9	16	19	26	26	26	20	27	32
Pulses	394	161	479	815	916	994	950	820	900
Peanuts	123	172	325	346	345	300	419	360	300
Cotton	3	4	12	16	18	21	15	18	17
Total**	2007	1877	2653	3231	3120	3334	3347	2701	3176
<u>Togo</u>									
Cereals	320	349	434	563	308	327	315	287	305
Roots/tubers	96	124	224	229	189	242	143	141	230
Pulses	49	52	69	75	78	113	62	68	69
Peanuts	23	27	40	44	45	45	45	45	45
Cotton	26	34	54	62	82	90	80	70	90
Total**	522	596	831	987	702	930	645	611	739
<u>Upper Volta</u>									
Cereals	1616	1395	1954	1954	1872	1924	1689	1899	1775
Roots/tubers	18	20	27	24	24	25	25	23	22
Pulses	146	138	484	468	385	370	370	360	440
Sesame	25	21	20	27	30	22	34	35	30
Peanuts	168	151	245	226	136	144	125	167	120
Cotton	99	48	43	75	85	84	72	109	80
Total**			2778		2536	2574	2520	2593	2467

* 1956-61 data has many missing values.

** Totals include small area of "other" annual crops.

TABLE 6
Trend in Yields of Annual Crops kg/ha (FAO data)

	1948-52	1952-56	1961-65	1966-70	1971-73	1970	1971	1972	1973	1974
Benin										
Rice	190	180	450	930?	1540		1404	1376	1421	1500
Maize	460	490	550	565	560	604	501	556	719	940
Sorghum/millet	440	490	480	532	600	483	682	616	670	574
				352	410	301	472	335	412	500
Yams	6700	6800	8995	9327	10159	9385	10657	10347	10461	10345
Manioc	4900	5300	5900	6600	6200	6543	6403	6084	1630	6545
Cotton	110	88	154	280	937	1018	982	1535	1630	1440
Peanuts	290	310	370	390	500	600	498	504	511	605
Drybeans	200	250	350	400	340	320	406	331	283	333
Ivory Coast										
Rice	510	600	890	1115	1330	1092	1365	1241	1379	1267
Maize	350	360	680	706	650	561	667	635	635	722
Sorghum	580	550	500	525	480	484	500	500	429	464
Millet	420	420	420	495	500	455	530	560	444	565
Yams	5900	7700	7300	7876	7750	7954	7750	7750	7750	8000
Manioc	4900	3600	2500	2900	3300	3313	3335	3257	3286	3472
Cotton	100	60	223	380?	817	641	848	934	954	954
Peanuts	440	540	620	740	812	800	820	808	808	900
Pulses, other	360	290	470	503	474	655	542	542	542	542
Niger										
Rice	660	720	1190	2476	1132	2262	1596	1656	2292	2048
Maize	690	730	710	577	460	584	671	505	481	600
Sorghum	590	660	660	547	525	557	600	368	278	500
Millet	350	380	500	403	380	415	374	370	400	393
Wheat	480	660	1160	1377	1090	910	906	1000	1000	1000
Manioc	3000	4700	8000	5900	4700	5310	5350	5363	6000	6000
Cotton	125	125	452	320	475	483	451	368	417	441
Peanuts	500	680	640	710	573	616	767	621	222	600
Beans, dry	110	90	160	117	60	86	69	158	110	111
Togo										
Rice	680	950	810	683	570	650	905	600	500	600
Maize	350	410	540	519	620	455	727	633	545	727
Sorghum/millet	530	540	400	451	550	433	556	926	847	875
Yams	5200	6000	8700	7981	7054	?	7542	7919	8045	6000
Manioc	5100	5900	6800	6500	6400	7489?	6335	7917	7857	6250
Cotton	180	163	147	130	212	200	200	263	300	200
Peanuts	580	450	480	390	407	400	556	444	222	222
Dry beans	210	260	270	290	380	306	515	320	300	317
Pulses, other	400	400	490	460	479	438	438	500	500	500
Upper Volta										
Rice	870	830	710	950	890	850	922	941	817	833
Maize	530	580	610	629	700	645	739	702	658	625
Sorghum	450	460	620	534	475	541	472	490	464	421
Millet	340	350	400	470	370	444	380	390	351	314
Sweet Potato			2108	2280	2500	?	2833	2667	2000	200
Cotton	124	124	160	200	453	354	533	486	256	300
Peanuts	310	370	510	470	433	484	458	482	376	333
Sesame	140	150	235	274	169	238	182	166	143	150
Cowpeas	160	220	235	290	236	292	250	250	208	229
Pulses, other	330	350	430	560	526	615	433	462	417	200

TABLE 7

Fertilizer Consumption 1972/73 and 1973/74, FAO*

		N	P ₂ O ₅	K ₂ O
		Nitrogen	Phosphate	Potash
		Thousands of metric tons		
Benin	1972/73	7.3	0.8	3.8
	1973/74	9.3	2.3	4.6
Ivory Coast	1972/73	8.8	4.0	17.9
	1973/74	6.0	7.3	14.9
Niger	1972/73	0.4	0.3	0.3
	1973/74	0.2	0.2	0.1
Togo	1972/73	0.3	0.2	0.1
	1973/74	0.3	0.2	0.2
Upper Volta	1972/73	0.6	0.5	---
	1973/74	0.4	0.1	0.1

Note: In Ivory Coast and Dahomey fertilizer is used in industrial and export crops such as coffee, cocoa, palm oil, bananas, and pineapples.

*FAO Monthly Bulletin Agric. Econ. and Stat. 24 (4) p. 25-26, April 1975.

TABLE 8

Trends in Domestic Grain Production 1948-52 to 1971-73 (FAO)							
	1948-52	1952-56	1956-61*	1961-65	1965-70	1971-73	1974
	000 tons/year						
<u>Benin</u>							
Rice	(0.4)	1	?	1	4	5	6
Maize	181	163	?	219	219	194	310
Sorghum	53	68	70	67	61	69	70
Millet							
Total	233	227		287	284	582	400
<u>Ivory Coast</u>							
Rice	104	109	120	220	321	347	380
Maize	55	49	106	159	129	114	130
Sorghum	13	12	30	10	12	16	13
Millet	33	30	42	40	34	30	45
Total	245	205	298	429	496	507	568
<u>Niger</u>							
Rice	3	4	5	11	34	35	43
Maize	3	2	3	3	2	2	3
Sorghum	244	290	284	306	309	213	250
Millet	371	411	623	897	584	483	550
Wheat	1	1	1	1	1	1	1
Total	621	708	916	1218	930	730	847
<u>Togo</u>							
Rice	7	12	11	19	19	16	15
Maize	47	51	72	85	108	72	80
Sorghum	92	114	95	113	157	127	140
Millet							
Total	146	177	178	213	284	280	235
<u>Upper Volta</u>							
Rice	11	14	26	34	37	33	25
Maize	89	65	73	97	100	61	50
Sorghum	352	306	692	629	557	496	400
Millet	221	198		296	356	265	200
Total	672	599	791	1115	1050	855	675

*Production figures for 1956-61 have about 30% of the values missing.

TABLE 9

Supply of Cereals and Roots and Tubers 1966-73

	1966-70	1970	1971	1972	1973
Benin					
			<u>000 tons</u>		
Cereals	301	300	262	300	257
Roots/tubers	1,321	1,332	1,293	1,156	1,115
			<u>kg/cap/year</u>		
Cereals	112	112	95	107	86
Roots/tubers	492	496	470	412	388
Cereal equivalent ²	123	124	118	103	97
Total cereal equivalent	235	236	213	210	183
Ivory Coast					
			<u>000 tons</u>		
Cereals	634	637	674	687	891 ³ (794)
Roots/tubers	2,143	2,294	2,236	2,330	2,335
			<u>kg/cap/year</u>		
Cereals	147	148	153	153	(153) ³
Roots/tubers	497	532	508	518	508
Cereal equivalent	124	133	127	129	127
Total cereal equivalent	271	281	280	282	280
Niger					
			<u>000 tons</u>		
Cereals	940	998	890	778	681
Roots/tubers	145	162	137	105	72
			<u>kg/cap/year</u>		
Cereals	244	259	225	191	163
Roots/tubers	38	42	35	26	17
Cereal equivalent	10	10	9	8	4
Total cereal equivalent	254	269	234	199	167
Togo					
			<u>000 tons</u>		
Cereals	287	269	225	215	192
Roots/tubers	1,661	1,625	1,694	1,672	1,412
			<u>kg/cap/year</u>		
Cereals	154	145	118	110	96
Roots/tubers	892	873	890	850	709
Cereal equivalent	223	218	222	212	177
Total cereal equivalent	377	363	340	322	273
Upper Volta					
			<u>000 tons</u>		
Cereals	1,075	1,064	944	922	902
Roots/tubers	88	94	94	90	65
			<u>kg/cap/year</u>		
Cereals	200	198	172	164	159
Roots/tubers	16	17	17	16	11
Cereal equivalent	4	4	4	4	3
Total cereal equivalent	203	202	176	168	162

¹ Corrected for increase in population.

² Cereal caloric equivalent 27% for manioc, 22% for yams; average of 25% used here.

³ Import into Ivory Coast in 1973 must include about 190,000 tons forwarded to interior countries.

B. SMALL FARMER DEVELOPMENT STRATEGY

There are a number of strategies at least theoretically open to the Entente States for meeting the food needs of the population. These strategies include:

1. concentration on single crop production through large or small farm units
2. concentration on development of relatively capital intensive production units operated by a small proportion of the rural population
3. concentration on development of relatively low cost approaches to improving productivity impacting on a substantial proportion of the rural population

The first alternative, which represents the prevailing agricultural policy until quite recently has left the Entente States in varying degrees of vulnerability to world agricultural market conditions. However, the choice between the generally more capital intensive and generally more labor intensive approaches to food production remains a real policy choice. In the former category are projects such as irrigation schemes with relatively high costs per hectare (\$3,000 to \$6,000) or per family (\$2,500 to \$4,000); mechanization with high cost rather than intermediate technology; large unit storage rather than small farm and market town storage facilities.

In considering an approach to increased food production, the sector goal identified in the DAP, a number of reasons support the small farmer emphasis on which this project is based, in addition to AID's Congressional Mandate.

First, the vast majority of food producers in the Entente States live in rural areas and engage in small plot farming:

	<u>Rural Population in 1974</u>	
	<u>Number</u>	<u>% Total POP.</u>
Benin	2.4 m.	84%
Ivory Coast	3.7 m.	77%
Togo	1.9 m.	87%
Niger	4.1 m.	95%*
Upper Volta	5.2 m.	89%

Hence, any approach to food production increase - other than plantation type agriculture or a focus on the relatively few medium size holdings - must in some sense be a "small farmer" strategy. This pattern exists because of the common traditional land tenure system under which tribal land is distributed to farmers in accordance with need, ability to farm or both.

*Including 15% to 20% nomads.

Secondly, when food shortages occur, it is usually the rural population which suffers because of the poor distribution system. Most food imports tend to remain in urban areas; and domestic food surpluses in one region cannot be transferred normally to a deficit region. Therefore, consideration of equity and need criteria again point to a small farmer strategy.

Third, recent evidence suggests that small farmer production methods tend to utilize the most efficient blend of factors of production, given relative costs. In capital-poor countries, the most labor-intensive production tends to be the most economically efficient. There is little doubt but that small farmer production is the most economically efficient.

Furthermore recent theory and fieldwork suggest that farmers are the rational utilizers of inputs in their world, as they see it. (See Theodore Schultz and Charllick's recent Study for AID in Niger). Therefore a technology or a set of techniques which can be demonstrated to produce results, without incurring excessive risk in the fragile ecological conditions of the northernmost Entente States, would be adopted rapidly by small farmers, and would have large spread effects if properly supported by extension services.

Finally, food production has been relatively neglected as a development priority in West Africa. This neglect affects not only the rural population, but the entire economic development of the Entente countries, which depend heavily on the agricultural sector for foreign exchange as well as domestic employment. Food production is a necessity for all farmers in rural areas; when farmers do not have reliable access to markets, they must produce much of what they eat. Inefficient food production absorbs large relative amounts of labor. Since labor is also a key constraint in cash crop production, it follows that increasing the efficiency of food production could both increase the amount of food produced and release labor so that more cash crops could be produced. Several evaluations of African rural development projects have shown that inefficient food production is a major constraint on cash crop production and increased small farmer incomes (See Uma Lele's forthcoming book based on the World Bank's recent African Rural Development Study).

C. HISTORY AND DEVELOPMENT OF PROPOSAL

1. Background of Project Proposal.

On Friday, June 6, 1975, Mr. Amagou, the newly appointed Ivorian Director General of Agriculture in a interview published in the daily paper, cited a new Presidential policy "which will certainly be confirmed by [the party] congress" to increase Ivorian production of basic food crops. This will be the next objective, replacing that for the first 15 years of independence, which was to develop and diversify the production of export crops.

Agricultural policies in other Entente countries are similarly evolving towards an emphasis on food crop production. This evolution has been hastened by the drought and by the unprecedented world-wide increases in the price of staple food crops.

In November 1974, Paul Kaya, Administrative Secretary of the Entente Fund visited AID in Washington, and proposed two separate projects relating to food production and agricultural credit respectively.

As the Project Design Team began the process of preparing Project Review Papers on these projects, several important observations were made which argued strongly for a configuration of the two projects, and a heavy technical assistance emphasis:

1. The sub-projects submitted by the individual countries reflected their relatively weak capacities to design projects in the complex agricultural sector. A major reason for this may be the pressure placed on the countries by the Entente Fund and by AID to submit the proposals by January 1975. Furthermore, the Entente Fund requested a catalogue of needs relating to food production. Thus the countries considered these proposals to be very preliminary, and recognized the necessity to rework them to fit AID's available funding as well as sub-project criteria. Finally, a number of sub-projects presented are under consideration for funding by AID on a bilateral basis (Development of Onchocerciasis-free Areas in Upper Volta, Niger Cereal production), or by the World Bank (See Multiplication in Ivory Coast, Millet and Sorghum Production in Benin).
2. The technological packages proposed by some projects were not sufficiently proven to be applicable at the early stages of the project. Since most agronomic research which has been done in the Entente countries is based on maximum fertilizer and other input conditions, applied testing at farm level conditions becomes essential to determine how the available packages can be rendered economically viable at the small farm level.
3. The existence of an actual agricultural credit gap for small farmers should be confirmed through a study of agricultural credit institutions, past performance, national credit policies, etc. Furthermore, the mere provision of credit to institutions does not assure that the small, economically disenfranchised farmer will be reached. To make small farmer-oriented credit effective, it must be linked to a broader package which includes appropriate technological packages, effective extension, and marketing mechanisms.

These observations led to the two-fold conclusion that 1) the Entente Fund can play a role in the food production priorities of the region, including the promotion and coordination of research to develop small farmer-oriented technological packages, and the expansion of government capabilities to identify, design, implement and evaluate rural development projects; and 2) a substantial design effort must be applied to the sub-projects before they can be considered for funding. The PRP called for separate FY 76 and FY 77 loan/grant operations. However, the design team, which was sent to the field in June/July 1975, was instructed to determine if a single operation for FY 76 financing could be developed. With adequate provision of technical assistance, the design team felt that the

capacity to design effective rural development projects could be included as a purpose of the project; that close cooperation between the project management team at the Entente Fund and project planners in the recipient countries would enhance planning capacity and facilitate effective implementation of the project; and that some of the needs addressed by sub-projects were sufficiently urgent to justify rapid action in the provision of technical assistance so that sub-projects could be funded by May 1976, in time for the growing season.

2. Evolution of Project Concept.

The sub-projects initially submitted to the Entente Fund had been prepared under great time pressure and with no guidelines as to the available amount of funding. A brief analysis of these subprojects is included in Appendix IV.

On the basis of the subprojects, the Project Design Team concluded that the needs of the Entente nations in the domain of food production are numerous, and that the Entente Fund through this project can play a significant role in encouraging national and regional responses to these needs. The first of these needs appears to be adaptive agricultural research, especially as it permits the evolution of small farmer-oriented technology. Four of the five Entente governments requested a heavy emphasis on adaptive agricultural research, followed by seed multiplication and application to small farm conditions. Furthermore, the Ivory Coast and Niger considered the training of their nationals in agronomic research a prime priority if their countries were to be capable of determining their own research priorities. Given the obvious need for viable technology packages which are applicable to traditional farming conditions, and the nearly complete lack of research in this area by IRAT and other local research stations (See Section IV.B.1. and Appendix I), this focus appears to comprise an essential emphasis for any food production loan.

The second need which emerged from sub-project requests is the development of a national capability to identify, design, implement and evaluate rural development projects. Thus training needs for the identification and design stage, the implementation stage, and the evaluation/feedback capability should be included in the project. The project should also attempt to draw on and develop the resources of local sociological research institutions both for evaluation needs and to encourage feedback and coordination among sociologists and rural development promoters.

Since the sub-project proposals of all of the Entente Governments were rather general in scope and far in excess of available funds, the team requested each government to submit a more definitive set of sub-projects. The officials who met with the team generally welcomed this opportunity, since the initial projects had been prepared under great time pressure, and in some cases government priorities had changed. One government official was actually embarrassed that the projects had been

transmitted to AID in such a preliminary state of preparedness. By the end of the team visit, the Entente Fund had officially contacted its member States to proceed with the submission of subprojects consonant with the availability of funds, and with AID's Congressional mandate of focusing on small farmer production.

Because the project planning capacity of the Entente States appears to be limited, the team proposed that the actual development and design of the project await the arrival of the project management team which will have access to technical assistance funds to provide the necessary expertise for all phases of project design. The team felt that the experience of developing rural development projects with experts provided through the Entente Fund would enhance the overall planning capacity of the Entente member States.

Thus, the project will finance specific subprojects which draw on and develop the research capabilities and the design/implementation capabilities of the Entente Governments. These subprojects provide in one sense the basis of the project since they will provide a means for contributing to the sector goal. In another important sense, they will also serve as a training grounds for the research and implementation capacities of the Entente States and, moreover, will provide the opportunity to test, and evaluate, and refine the basic small farmer strategy. This continual interaction between research, design, implementation, and evaluation will provide the best real-world training for the participants in the project.

III. DESCRIPTION OF PROJECT

A. Goal and Purpose

In view of the importance of agriculture in the economies of the Entente Member States, growth of agricultural production has been their foremost goal for economic development. In the past, they have concentrated their efforts and the available resources on achieving production increases in those crops which are foreign exchange earners, such as coffee, cocoa, cotton, and peanuts. As a result, food production suffered from relative neglect, increasing at a rate too slow to meet growing demand. Now, however, in the face of large food imports and the disruptions caused by the Sahel drought, and in view of accumulating evidence that inefficient food production is a constraint on the increased cash crop production, the Entente Member States are giving greater emphasis to food production as an important objective of sectoral development.

The goal of this project reflects the new emphasis which the Member States are giving in agriculture sector activities. The goal is to increase the per capita production of staple food crops for domestic consumption. Crops which will be eligible for assistance under this project include cereals, roots, and other fruits or vegetables which are commonly produced by small farmers and consumed domestically by the poor majority.

Recognizing the key role which small farmers play in the production of basic food crops and the resulting importance of exploiting the potential which exists for increasing their productivity, the Member States and the Entente Fund have committed themselves to planning, implementing, and evaluating a strategy of assistance to small farmers as a principal means of achieving the sectoral objective of increased food production. The commitment of the Entente Fund and the Member States to pursue this strategy of assistance to small farmers for food production represents a significant new policy emphasis in the agriculture sector and they realize that a number of other policy changes will be required in order to implement and evaluate it successfully.

The purpose of this project is to assist the Entente Countries to make the necessary adjustments in their agriculture sector policies which will enable them, with the assistance of the Entente Fund, to implement the strategy of assistance to small farmers and to evaluate its efficacy as a means of meeting their needs for increased food production.

Among the policy objectives which the Entente Fund and the Member States have agreed to effect are:

- 1) To give increased emphasis in national and other programs of basic and especially adaptive agricultural research to small farmer production systems, the needs of small farmers for packages of improved production technologies, farm management practices, and other inputs, and to the means of delivering credit and other vital services and inputs such as seeds and fertilizers to small farmers;

2) To incorporate food production components into existing cash crop production schemes in order to take greater advantage of installed capacities for the delivery of inputs and services to the small farmer;

3) To adjust small farmer credit policies so as to increase the amount of such credit available, offer longer grace and repayment terms to small farmers, and to allow higher interest rates in order to provide credit institutions with sufficient financial incentives to institutionalize the supply of such credit;

4) To coordinate programs of basic and adaptive agricultural research carried out by African and international development research institutions in the Entente region and to foster the exchange of information concerning the findings of those programs;

5) To evaluate small farmer food production projects financed by this and other sources of funds and to exchange on a regional basis the results of those evaluations so as to be able to incorporate them as appropriate into the design of subsequent projects;

6) To begin in FY 1977 an on-going process of sector assessment which will refine the identification of constraints to small farmer food production and sharpen the focus of the solutions proposed; and

7) To give increased emphasis in national manpower development policies to the allocation of resources to support training in fields directly related to small farmer development and food production.

By the end of the project, the reports of the Entente Fund's project management team, the reports and planning documents of African and international research institutions, and the reports and development plans of the Member States for the agriculture sector will show these policies have been undertaken. Moreover, on the basis of favorable results from such interim and final subproject evaluations as are possible, the Member States will be designing and/or implementing additional food production projects using a refined strategy of assistance to small farmers.

B. Project Outputs

1. Entente Fund Capabilities

The Entente Fund currently has a limited capacity in the rural sector. Its capability to assist the Member States in the design, implementation, and evaluation of small farmer food production projects will be strengthened through the addition of a three-man project management team, financed by the technical assistance grant, as well as through the actual process of subproject development and implementation. This

capacity will be carried beyond the disbursement period of the technical assistance grant and institutionalized to a certain extent because reflows to the Entente Fund resulting from the interest rate differential which are in excess of the amounts needed to guarantee the Fund's timely repayment to AID will be used to provide the continuation of technical services. This institutionalization of the Entente's capability to provide technical assistance in the agriculture sector will be one of the project's outputs and should also be counted among the project's benefits.

2. Member State Capabilities to Promote Small Farmer Food Production

This project cannot aspire to solve all the food production needs of the Entente States. Rather, it was designed as an effort to reinforce the Member States' commitment to reorient agriculture sector policies in such a way as to permit the successful testing and evaluation of the new strategy of assistance to small farmers as a means of augmenting food production. Therefore, if the goal of the project is to be achieved over the long range, improvements in the Member States' current abilities to plan, implement, and evaluate rural development and, specifically, food production projects will be important. Without improved capabilities in this regard, the translation of national priorities into effective actions will be inaccurate and will produce less than the desired results. One of the outputs and important benefits of this project will therefore be an improved capability in the Member States to deal with all phases of small farmer food production projects.

The present project provides an excellent training ground for personnel of the Member States' Ministries of Agriculture, Rural Development, and/or Scientific Research. The Entente Fund's project management team and the short-term expert contractors will work closely with government planning officials to design the subprojects. Similar collaboration will be maintained throughout all the later phases of implementation, evaluation, and reassessment of design. Key operational-level personnel from each of the Member States will benefit from long or short-term academic training programs in the U.S. in fields directly related to small farmer development and food production, and will be better prepared to assist in developing small farmer oriented projects and sector policies following their training. Planners, extension agents, and others will also gain valuable insights from the process of sharing experiences and discussing common problems at short-term, in-country training courses, seminars and other exchanges of information which the Entente Fund will organize and sponsor.

3. Small Farmer-Oriented Food Production Subprojects

The most visible of this project's outputs will be the small farmer food production subprojects which it will finance and which will provide the opportunity for testing the value of a strategy focussed on

small farmers as a means of narrowing and finally closing the gap between the production of staple food crops and the domestic demand for them.

The crops on which the subprojects will concentrate will be chosen according to the priorities of the Member States. Among the selections will be staple crops such as cereals, roots such as manioc, and fruits and vegetables which are commonly produced by the small farmer and consumed domestically by the poor majority. For the selected crops, the project will promote in various ways the achievement of higher equilibrium levels of production, marketing and prices, all of which are highly inter-related. Each of the Entente States is potentially capable of supplying itself (and perhaps some other countries) with basic cereals, including rice, and in some cases, even wheat (e.g., Niger). However, the levels of food production have remained insufficient for reasons including soil fertility and low-yield varieties, as well as inadequate marketing facilities and unfavorable price policies. Thus it should be noted that excessive production in the short run could harm rather than help the small farmer who is the pawn of cereal traders, and bears a disproportionate burden of decreases in price resulting from excessive supply in the short-run.

At the present time a major deterrent to increased food production is low and uncertain producer prices. Where prices have risen in recent years (rice in the Ivory Coast, sorghum and millet in Upper Volta and Niger, production has increased during years of adequate rainfall, but marketing facilities were inadequate to purchase all the grain produced. This may result from excessively high guaranteed prices. Alternately, given the thinness of markets for most cereal crops, slight over-production can cause excessive price decreases. Therefore, prices must be close to an equilibrium level if production and markets are to remain stable.

By increasing the level, efficiency, and reliability of food production by small farmers, the farmers themselves can devote less energy to subsistence production, and can determine for themselves whether to produce export crops or food crops as cash crops. Thus the income level of farmers will increase rather than be subjected to the fluctuations of thin markets in food crops. Stability of prices and markets will then permit further expansion of food production commensurate with the rational evolution of markets over time.

The subprojects will range from rural development projects which emphasize food production in well-defined regions, to provision of credit for farm implements; training to encourage respect for agricultural timetables, e.g., planting by a certain date; support for farm implement manufacture or domestic fertilizer production; seed multiplication; dissemination of reliable higher-yielding varieties; training of extension or credit agents, and support in research to adapt technological packages to local conditions and in training to assure a permanent capacity in this

vital area. Most projects will include several of the above components; however, the PP team, pursuant to consultation with the Entente Fund and Entente member governments, considers that single function projects such as seed multiplication or the manufacture of farm implements complemented by credit and follow-up should be admissible as subprojects if the infrastructure for their effective dissemination exists, and if they address a vital link in improving small farmer food production without resulting in other imbalances, and are viable without other supporting interventions.

An illustrative list of subprojects, subject to refinement as the Entente Fund begins the process of collaborating in every phase of subproject development, is included in Section III.G. below. The criteria for the eligibility and design of subprojects are discussed in Sections III.D. and IV.A.2, respectively.

Since agricultural credit is foreseen as a component of most subprojects, a secondary output of the project will be improved access to credit on reasonable terms. Although agricultural credit was foreseen as a major component of the project at early stages of project design, the design team felt that small farmer credit required substantial follow-up and technical assistance. It appears to be preferable to begin with small, carefully administered credit programs which are complemented by other subproject elements, in order to insure favorable small farmer experience with credit.

4. Other Outputs

Other outputs which this project will produce will flow primarily from the efforts of the technical assistance and project management team located in the Entente Fund. These include: seminars, short-term, in-country training courses and for Member State rural development personnel, and other exchanges of information; planning and evaluation studies of small farmer food production projects and other research projects carried out by the Project Management Team or short-term consultants; meetings to discuss the results of such studies or evaluations with national rural development staff; meetings with national staff and the staff of African and international research organizations to discuss research being carried out, to coordinate plans for future research, and to determine how research may better be brought to bear on the planning process for small farmer development projects; and the sector assessment which will be undertaken in FY 1977 to meet the need for a continuing process of analysis of sectoral constraints and identification and refinement of the solutions proposed.

Although these outputs may in a sense be considered subsidiary, they are nonetheless important since they will contribute substantially to the successful achievement of the other outputs described above.

C. Project Inputs

Capital assistance

AID project inputs include capital assistance on both a loan and a grant basis. Capital assistance totals \$15 million: \$10 million in loan funds will be provided primarily to the coastal Entente states, Benin, Togo and Ivory Coast, although the Sahelian Entente states will be eligible for use of loan funds for various revenue producing components of subprojects, to the extent that they are inclined to do so. Five million dollars in grant funds will be provided to the Sahelian Entente states, Niger and Upper Volta, and to Benin.

Initially, these funds will be allotted equitably among the Entente countries. The Entente Fund has proposed the following initial distribution of funds:

	<u>Ivory Coast</u>	<u>Togo</u>	<u>Benin</u>	<u>Niger</u>	<u>Upper Volta</u>
Loan	\$3.5m	\$3.5m	\$2.0m	\$0.5m	\$0.5m
Grant	0	0	\$1.0m	\$2.0m	\$2.0m

If within a year after the initial disbursement date of the project a country appears to be unable to utilize its portion of capital funds, other countries will be given opportunities to submit subprojects on an equitable basis. No country may utilize more than 30 percent of total project funds, or \$4,500,000.

The Entente Fund will aim at acquiring country contributions of about 20 percent of subproject costs. This requirement is intended to assure host country commitment to the subproject, as well as the capacity of the host country to assume all project costs by the end of the third year. Counterpart funding will support local costs such as land-leveling, construction, land grants for seed multiplication and research, and local personnel.

During FY 1976, \$790,000 of the technical assistance grant will be obligated and the initial \$3,000,000 tranche of loan funds authorized. In FY 1977 the initial \$3,000,000 of the grant for capital assistance will be obligated. Subject to the availability of funds, the remaining amounts will be authorized and/or obligated during FY 1978. The Member States have already submitted a number of proposals to the Entente Fund in varying stages of preparation. A major task of the Project Management Team will be to develop in close collaboration with Entente Country officials those sub-projects as rapidly as is possible and technically sound to the point where they will be eligible and ready for financing.

The Entente Fund will request AID's approval of all subprojects as soon as possible in the initial stages of project design. AID's approval will be conditioned on a positive determination that the subproject meets the eligibility criteria in Section III.D. of this paper and neither duplicates nor conflicts with other AID or other donor activities in the Entente region. In addition, for each subproject involving more than \$1,000,000 of AID loan and/or grant funds, AID will review the final proposal in terms of its economic, financial, technical, and social feasibility and give its approval before the Entente Fund obligates funds for it.

The disbursement period of the project will be for five years, in order to insure the institutional viability of the Entente Fund and the member countries with respect to the design and implementation of small farmer food production projects. The disbursement period of the individual subprojects will be approximately three years; however, the close collaboration with the Entente countries required to promote their institutional capacity will necessitate some lead time before actual subproject implementation can commence.

2. Technical Assistance Plan

A three year technical assistance grant in the amount of \$1,680,000 will support the project (see the budget in Table 10, following page). After disbursement of this grant, the Entente Fund will utilize those funds accruing to it as a result of the interest rate differential which are in excess of amounts needed to guarantee the Fund's prompt repayment to AID to continue the provision of technical assistance and research and analytical support to the project. In addition, the Entente Fund will provide for the same purposes an annual contribution from its budget in the amount of CFA 15,000,000 or more, subject to the availability of those funds.

The Entente Fund's Project Management Team will consist of three AID-funded, American advisors: an agricultural economist, a rural development specialist or rural sociologist, and a crop production expert. These advisors will work closely with the Entente Fund's agricultural expert and will report directly to him and to the Administrative Secretary of the Fund. The team will be responsible for all aspects of subproject identification, design, implementation and evaluation, relying to the extent possible on local institutions. The rural development specialist will in particular be responsible for the coordination with local sociological research institutions of special surveys and evaluations of each subproject, and for sociological research in support of subproject design and implementation.

TABLE 10

TECHNICAL ASSISTANCE BUDGET

	<u>FY 1976</u>	<u>FY 1978</u>	<u>TOTAL</u>
1. Project Management Team: Two full-time professionals for three years each, plus one professional for 18 months, including skills of an agricultural economist, rural development specialist or sociologist, and a cereals or crop production specialist, at \$70,000 per annum.	315,000	210,000	525,000
2. Ten 2-year scholarships for agronomists for study in U.S. in food production (two scholarships per country), or equivalent in local or third-country training	50,000	150,000	250,000
3. Five 2-year scholarships for sociologist/rural development training in U.S. (one scholarship per country) or equivalent in local or third country training	30,000	70,000	100,000
4. Seminars and in-country training of Entente States personnel in agricultural planning, credit, extension, and cultivation	50,000	115,000	165,000
(a) Three 2-week seminars per country at \$10,000 each	(50,000)	(100,000)	(150,000)
(b) Two 1-month trips for on-site training in Africa (to Bambey, Senegal; or Samaur, Nigeria; etc.) at \$1,500 per trip		(15,000)	(15,000)
5. Short-term consultants to assist in project design and/or implementation	150,000	100,000	250,000
6. Subproject-related support in applied agronomic/economic research on a short or long-term basis	75,000	115,000	190,000
7. Subproject-related social science research and evaluation, for use by national sociological research groups, including contractors to assist them as necessary	70,000	80,000	150,000
8. Sector Assessment	50,000	50,000	100,000
GRAND TOTALS	<u>790,000</u>	<u>890,000</u>	<u>1,680,000</u>

The project management team will be complemented by the Entente Cereal Project team residing in Niamey and the Entente African Enterprise team residing in Abidjan. The former team consists of a training officer, an engineer, and a grain storage expert. The latter team includes a financial expert who can assist with the credit component of subprojects, since he is familiar with local development banks.

Special measures will also be taken to provide training and technical assistance in the following key areas crucial to subproject implementation.

a) Agronomic Research. The project will provide assistance for adaptive agronomic research in countries as necessary for the success of subprojects. This research support will consist of assistance to local agricultural research institutions to encourage field testing of technologies promoted by subprojects. Assistance will also be provided to encourage active linkages with international agricultural research organizations cited in Table 15 in Section IV.A.3, through appropriate visits and short-term training at these organizations. Finally, technical assistance funds may be used to finance foreign experts on a short-term or full time basis. Complementarity among areas of expertise, and with other donor-funded research projects such as the JP 26 project, will be considered in choosing these experts. Niger, for example, has requested a rice expert for improving traditional farming practices in bas-fonds, cuvettes and flooded river banks. Benin has also expressed interest in this approach to rice cultivation. One rice expert could contribute to subprojects in both these countries. Similarly a maize specialist in the Ivory Coast could benefit all coastal countries and perhaps Upper Volta. In Upper Volta, it is anticipated that subproject activities will be coordinated with the ICRYSAT sorghum and millet expert located at the IRAT station near Robo-Dioulasso.

The subproject will provide ten scholarships (two per country) to train agronomists in the United States or other Code 941 countries such as Tunisia or Nigeria (IITA) at the Master of Science level. National priorities in the Entente countries are focusing increasingly on their research capability, without which they cannot determine and implement their own research and production priorities. The beneficiaries of these scholarships will be determined by the Entente Fund project management, AID country representatives and host country representatives.

b) Sociological Research. One scholarship per Entente country will be offered at the Master level to train a sociologist or rural development specialist. The project will draw on and develop the resources of local sociological research institutions both for evaluations and to encourage feedback and coordination among sociologists and rural development personnel. \$200,000 has been set aside to fund sociological contributions to project design efforts, evaluation of implementation procedures, and to conduct base line studies, small farmer budget surveys, and other evaluations.

D. Eligibility Criteria for Subprojects

1. Eligible Beneficiaries

The ultimate beneficiary of the project is the small farmer who will participate in subprojects. These small farmers will benefit through intermediary sub-borrowers. Eligible sub-borrowers include the governments of the Entente member states; their semi-autonomous mixed corporations; their states corporations; their public institutions given a legal entity and financial autonomy; and their professional societies, cooperative associations or semi-private enterprises which are legally established and recommended by Entente governments.

2. Eligible Subprojects

Subprojects should promote a self-sustaining process of development (as distinguished from a resource transfer) by means of operations falling into the following categories:

i) Integrated rural development projects with primary emphasis on a food crop, but without ignoring cash crops for purposes of increasing income, economic use of fertilizer, repayment of animals and farm implements and crop rotation. This approach is in recognition of the fact that food production, like cash crop production, does not exist in a vacuum, but should be treated as an integral component of a mixed farm system.

ii) The addition of a food crop component to an existing project which focuses primarily on cash crops. This approach allows the project to benefit from existing extension, input and marketing infrastructure. The project management team should seek out such vehicles for subprojects where possible.

iii) Discrete single-function subprojects which address critical bottlenecks in small farmer food production without creating imbalances in the overall production/marketing system. Agricultural credit, particularly medium term credit at reasonable terms, may constitute one such bottleneck if extension follow-up can be assured. Other possibilities include the exploitation and delivery of phosphate deposits in Upper Volta or Niger, thereby providing cheap, crushed fertilizer at about 15 F CFA per kilogram; the manufacture and repair on an artisanal level of simple farm implements such as plows, hoes, seeders and carts; seed multiplication or seed protection; adaptive research; experimentation with new farm techniques which have not been fully tested. Each single-function project should analyze how its benefits will reach small farmers and impact on food production. In other words, for a seed multiplication project, the distributive network to small farmers and supportive deliveries of other essential inputs and technical assistance should be described.

3. Criteria for Subprojects

The following criteria will be applied to subprojects to determine their eligibility for funding under this project:

a) The subproject must address food production needs oriented primarily towards small farmer and other domestic consumption. This criteria will assure that domestic consumers are the primary beneficiaries of subprojects.

b) The subproject must direct production efforts towards small farmers as the primary means of expanding food production. This criteria will assure that project planners respect equity and income distribution considerations.

c) No subsidies for agricultural inputs will be financed by project funds, except under special circumstances, such as the demonstration of the use of local phosphate fertilizers, etc. However, AID recognizes that price distortions are rampant in the Entente countries at numerous levels which affect the small farmer. Thus the low producer prices received by small farmers tend to render economically unviable at the small farm level the purchase of inputs of fertilizers, seeds and pesticides without subsidies. Therefore, in select cases where sufficient justification can be made, AID funds may be used to finance subsidies on a limited basis and with a plan for phasing out the subsidy or finding alternative means of financing the subsidy. For example, AID does not object to subsidies financed from the profits of marketing boards which pay low producer prices, or from phosphate revenues if a country such as Togo decides to embark on this course. However, unlimited use of AID project funds for subsidies would rapidly deplete project funds, and would not generate a self-sustaining impact on small farmer food production, since the subsidy could not continue forever.

The principal of no subsidies financed by project funds, except in special circumstances, applies to all project funds, including grants to the Sahelian Entente states. It also applies to agricultural credit. (See Section III.D.5 below)

d) The subproject should be fully disbursed and self-sustaining (with possible local government support) at the end of a three year period. This provision ensures that subprojects will have immediate impact on increases of domestic food production.

The subproject should address substantive aspects of project design such as technological packages, the role of women, input delivery, marketing and spread effects or replicability in accordance with the Subproject Analysis Framework outlined in Section IV.A.2.

4. Terms of Subloans

The terms of subloans to Entente member states will be the following: up to 3.5% for the ten-year grace period of the sub-project and 3.5% during the thirty-year repayment period. For exceptional subprojects which generate sufficient revenue to assure repayment over a shorter time-frame, the Entente Fund may set appropriate grace periods and repayment periods, subject to AID approval.

A strong justification can be made for allowing the Entente Fund to pass along the subsidy inherent in the ten-year grace and thirty-year repayment period of the AID loan to the Member States, which bear the risk and responsibility of assuring the financial and economic viability of these small farmer projects. The Entente Member States bear the additional responsibility of repaying the loan to AID.

The Entente Fund will incur no long term costs in the implementation of the project beyond those covered by the AID technical assistance grant, the small interest differential accruing over the life of the project, and the Fund's own contribution to project costs. Therefore it appears to be reasonable to pass the benefit of AID loan terms to the governments and the small farmers who are the intended beneficiaries of the project. The interest differential accruing to the Entente Fund will permit a continuation of technical assistance and research support after disbursement of the technical assistance grant.

5. Terms for Agricultural Credit

The principle that AID funds will not finance subsidies for agricultural inputs has been preserved in the design of this project. The extension of this principle to agricultural credit means that the minimum interest rate for credit financed from project funds will be equivalent to rates effective in the commercial bank sector for agricultural credit. At the present time, this rate is around 6%.

There are numerous justifications for raising agricultural credit interest rates to market rates or even higher. First, agricultural credit to small farmers bears a high risk factor and is expensive to administer. Interest rates should be high enough to cover these costs in order to avoid the depletion of capital resources allocated to agricultural credit. Second, high interest rates promote the institutionalization of agricultural credit so that it is accessible to a larger proportion of the population: as long as credit is scarce, all farmers cannot have equal access to credit. But when agricultural credit is profitable to credit institutions, then it will become more widely available. At low interest rates, the supply of credit may be limited: therefore, a large number of farmers will have access to credit only through traditional money lenders at 40% to 100% or more, or will choose to undertake no credit obligations. At higher interest rates, the supply of credit would increase and could be available at reasonable terms to more farmers.

Furthermore, recent evidence indicates that high interest rates do not discourage small farmers' willingness to borrow or ability to repay loans. A recent AID-sponsored study (Development Alternatives, Inc., "Strategies for Small Farmer Development) found, on the basis of evidence from 36 rural development projects, that the level of interest rates charged small farmers (within reasonable limits) correlates positively with repayment rates and the incidence of borrowing from credit intermediaries. Seven of the most successful projects analyzed in the study encouraged savings by offering high interest rates, which in turn was re-lent to other farmers at still higher rates.

Finally, high interest rates serve as a screening device which restricts project benefits to small farmers and eliminates wealthier farmers who can obtain cheaper credit elsewhere. In any uncontrolled credit situation, this is the only effective device to limit credit to small farmer beneficiaries.

Therefore, the credit provided through subprojects will aim at market rates of interest (e.g., around 10% to 12% at the present time) or higher. The ultimate rate will depend on the credit institutions assessments of its needs to cover costs, risks, and capitalization. It must be recognized that subsidies of all agricultural inputs are part of a long colonial tradition in the Entente region, and hence interest rates may not shift upward as rapidly as desirable. However, the Entente Fund has accepted to aim for market interest rates, and to impose a minimum interest rate of the current commercial agricultural credit rate in all subprojects. It is conceivable that local agricultural credit institutions will recognize the merits of the above arguments, and accept to raise interest rates above the imposed minimum rate.

6. Source/Origin Procurement

The project will finance local and foreign exchange costs of small farmer food production projects in the Entente states. Project funds will be used primarily for local currency financing, since local currency represents the major needs of the least developed countries and the most severely affected countries which are members of the Entente Fund. In order to maximize U.S. and other Code 941 procurement, a minimum provision of 10% of project funds will be retained; however, U.S. Code 941 procurement may well exceed this minimum provision. Finally, up to 5% of project funds will be eligible for U.S. Code 935 procurement to be used only for the financing of vehicles essential to carry out subprojects, and for technical services in accordance with the guidelines established below.

a) Procurement of Commodities

About 85% of project funds will be used to finance local currency costs of subprojects. This provision applies to grant funds as well as loan funds. Section V.G. includes a request for a waiver from the usual provision which ties grant funds to procurement for the

U.S. This waiver will permit these grant funds to be used to address the most pressing needs of the poorest of the Entente countries, Upper Volta, Niger and to a lesser extent Benin, in the domain of food production. Thus loan and grant funds will be administered in accordance with a similar set of regulations.

U.S. Code 941 procurement will constitute a minimum of 10% of project funds for both loan and grant monies. This general guideline will be issued to each participating country, and will be applied to both goods and services financed under project funds. For the purposes of this provision, all procurement from the Entente countries other than the host country of the subproject will be considered Code 941 procurement. Although the project imposes a minimum of 10% of funds for Code 941 procurement, it is anticipated that Code 941 procurement may be as high as 20% to 25% since fertilizers, seeds and other inputs may constitute a large portion of subproject costs.

AID Code 935 procurement will be limited to vehicle requirements of subprojects and contractor services relating to subproject design, implementation, and evaluation. Code 935 procurement may not exceed 5% of total project funds, of which up to two-thirds may be used for vehicles and one-third for technical services, financed from capital funds or from the technical assistance grant as required.

b) Shelf Item Procurement

The following definition will be applied to imported shelf items fundable under the project: Items which are normally imported and kept in stock, in the form in which imported, for sale to meet a general demand in the country for the item, are eligible for AID local currency financing, so long as:

- 1) They do not contain components from other than free world countries; and
- 2) No single shelf item procurement transaction involves more than the local currency equivalent of \$2,500.

c) Procurement of Technical Services

The necessity of contracting technical services from Code 935 countries in the course of project preparation and implementation is likely to occur simply because French-speaking American technicians are of limited availability. Waivers for contracts funded under the capital and T.A. grant may therefore be requested. (See Section V.G.) subject to the following conditions:

- 1) The Entente Fund cannot support the cost from its own technical assistance contribution of at least \$68,000 per annum;
- 2) No member of the project management team may be funded from Code 935 countries; and
- 3) The Entente Fund must demonstrate that it has conducted a search for technical assistance from U.S. Code 941 procurement sources for a period of no less than three months. This search will commence with advertisements in appropriate newspapers and journals, including the Commerce Business Daily, the Small Business Circular, the New York Times, the Herald Tribune, and the Wall Street Journal, as well as technical papers oriented towards the specific talent required. If, at the end of this search, there are no possibilities among U.S. and African technicians, AID may grant a waiver for a qualified Code 935 contractor.

The remainder of procurement for services under the technical assistance will be limited to local currency financing and U.S. Code 941 procurement. A waiver will be sought to untie grant funds for both technical assistance and capital financing for local and Code 941 procurement.

7. Borrower Contributions and Grantee Contributions

a) The Entente Fund

The Entente Fund will bear a portion of the local costs of technical services and assistance, local training and a portion of U.S. Code 935 procurement for the provision of technical services. The Fund has pledged to contribute F CFA 15,000,000 or \$68,000 to the project in CY 1976, and possibly more in future years.

b) Recipient Countries

The Entente member countries will provide a contribution of approximately 20% of subproject costs. This participation will ensure that the government is committed to the project. It will also provide government with dispensable resources with sound development-oriented investment opportunities. (See Financial Analysis, Section IV.E.2.). Counterpart funding will be used to finance local costs such as personnel, rural engineering including preparation of land for low-cost irrigation, seed multiplication or research, and construction.

E. The Borrower and Implementing Agencies

1. The Borrower and Administering Agency - Entente Fund

The Borrower and Administering Agency is the Mutual Aid and Guaranty Fund (The Entente Fund) of the Council of the Entente. The Entente Council is a political association established in 1959 by the governments of the Ivory Coast, Niger, Upper Volta, and Benin, and joined by the government of Togo in 1966. The Entente Fund was created in 1966 and, in recent years, has become an economic development institution which has served as a vehicle for channeling AID assistance to the five Entente countries. The principle objectives of the Fund are to:

- 1) provide a Guaranty Fund to encourage investments in the Member States;
- 2) foster increased trade, commerce and investment between the Entente countries;
- 3) promote economic integration in the region; and
- 4) develop specific projects and obtain assistance from donors.

The 1966 convention creating the economic and development arm of the Entente Council, i.e., The Entente Fund, provides for a Secretariat headed by an Administrative Secretary. The present Administrative Secretary, the only African on the staff, is assisted by a staff of four donor-financed advisors, three French and one American. These advisors perform the essential technical and management tasks of the Fund including financial management and budgetary control. They also advise the Fund on the development and implementation of projects within the Entente region. Special development projects such as the AID-funded African Enterprise project, and the present project are managed by contractors specifically recruited for the projects.

2. Implementing Agencies

The Chief responsibility for implementing subprojects at the national level will be the Ministry of Agriculture or of Rural Development in each country. These ministries will coordinate the administration of the various components of subprojects among the following national agricultural institutions. See Section IV.C.2. for an analysis of these institutions.

a) Extension Services

Upper Volta - Organismes Regionaux de Developpement (ORD) have been established since 1965 to plan and implement development programs in their respective regions.

Niger - The Unione Nigerienne de Credit et de Cooperative (UNCC) was established in 1962 and reorganized in 1967 to promote cooperatives and train extension agents.

Ivory Coast - Societes de Developpement Autonome have been set up by the government for the development of one or more specific crops.

SATMACI, established in 1958, carries out development programs for coffee and cocoa; SODEFALM, established in 1963, handles palm oil production; CDTT handles cotton and textiles; SODERIZ has handled rice production since 1970; and the AVR which is responsible for developing the Bandama River Valley. The Ivoirien government is currently developing a plan to create an umbrella organization in each of the ten regions of the country to coordinate these development programs and to add a food production component to these programs.

Togo - Societe Regionales d'Amenagement et de Developpement (SORAD) were established in 1967 for each of the five administrative regions and made responsible for development programs, extension services, provision of inputs and implements, and to act as intermediaries between the credit institutions and farmers. At the present time the Ministry of Rural Development is undergoing a reorganization which may remove extension services from the SORADS.

Benin - Centre d'Action Regionale pour le Developpement Rural (CARDER) recently created organizations to consolidate rural development planning and implementation.

b) Agricultural Credit Institutions

Upper Volta - Banque Nationale de Developpement (BND)

Niger - Caisse National de Credit Agricole (CNCA)

Ivory Coast - Banque Nationale de Developpement Agricole (ENDA)

Togo - Caisse Nationale de Credit Agricole (CNCA)

Benin - Banque de Developpement de Dahomey (BDD)

c) Marketing Institutions - In recognition of the crucial role which marketing plays in any attempt to increase food production, this project will make a concerted effort to assure a reliable marketing system within the context of each sub-project. This system may involve special relations with the relevant national marketing institution; the organization of marketing cooperatives; the provision of grain storage facilities at a small farm level to enable farmers to control their own marketing arrangements; or assistance to private traders (possibly through the Enterprise project) or to semi-autonomous agencies, such as AGRIPAC in the Ivory Coast, who will enter into contractual agreements with small farmers to purchase a given amount of grain at a guaranteed price. Since a limited portion of project funds will be eligible for Code 935 procurement for transportation, the project can extend

considerable assistance in this area, assuring the vital marketing link in each subproject.

In some cases the Entente Fund may attempt to establish special links of an experimental nature with the national marketing board or other middlemen to guarantee the purchase of a given amount of grain at a given price. The following marketing boards exist in the Entente countries at the present time:

Upper Volta - Office Nationale de Cereals was created in January 1971 as a price stabilizing agency for cereal crops.

Niger - Office des Produits Vivrier du Niger (OPVN) was established in 1970 to reduce cereal price fluctuation, to maintain buffer stocks and to promote cereal production.

Ivory Coast - Marketing is handled through the autonomous development societies, and no maize marketing board exists at the present time.

Togo - Togograin, recently established in 1973/74, is a public agency which is supposed to regulate the supply and prices of all food crops.

Benin - No marketing agency exists for food crops, which are marketed at the farm level through traditional channels at prices which hardly stimulate farmers to increase production. The government is encouraging the development of cooperatives which might perform marketing functions, but little progress has been achieved thus far.

d) Agricultural Research

Each Entente country has its own agricultural research institutions. IRAT (Institut de Recherche Agronomique Tropicale), sponsored by the French and directed from Paris, is represented in each Entente country, and performs basic research, which appears to be oriented towards maximizing yields rather than optimizing production. Little of IRAT's work spreads beyond its research stations in the Entente countries, since adaptation to local conditions is not IRAT's responsibility. Whatever adaptation or extension occurs is carried out through the extension services on marketing agencies described above. Other research services are mainly cash crop oriented, although major international research institutes are represented in some countries; ICRISAT has placed a sorghum/millet breeder at an IRAT station near Bobo-Dioulasso in Upper Volta, and contacts are maintained between IRAT and IITA, WARDA, ICRISAT, IRRI and CIMMYT. See Section IV.A.3. and Appendix A for further discussion of research capability.

e. Sociological Research

The following institutes will provide sociological expertise to conduct evaluations of subprojects, and other studies which promote the design of subprojects and of rural development in general:

Upper Volta - Centre Voltaique de Recherche Scientifique (CVSR) and Societe Africaine d'Etudes pour le Developpement (SAED).

Niger - Institut de Recherche Sociologique et Humaine.

Ivory Coast - Centre Ivoirien de Recherche Economique et Sociale (CIRES) and SONADES, charged with research in rural extension.

Togo - Institut Polyvalent de Recherche de l'Economie Rurale.

Benin - To be determined.

F. Subproject Approval Process

1. Subproject Submission

The development of subprojects will require close collaboration between the Entente Fund's Project Management Team and Member State officials. Before the Entente Fund obligates funds to finance a subproject, the Fund and the Member State officials must be satisfied that all necessary plans and analyses are complete and that the subproject is technically and socially sound, financially and economically feasible, and consonant with the objectives of this project as outlined in Sections III.D. and IV.A.1. The Entente Fund's obligation of funds for a subproject will be based on and subsequent to its approval of a project proposal prepared in accordance with the Subproject Analysis Framework outlined in Section IV.A.2. and formally submitted to it by the government of the Member State.

2. AID Approval of Subprojects

AID will approve subprojects through REDSO/WA on the basis of REDSO/WA's assessment and comments from the Country Development Officer in Upper Volta and the Regional Development Officer in Niamey, who is responsible for AID programs in Togo, Benin, and the Ivory Coast as well as Niger.

AID will review all subprojects and approve them on the basis of a positive determination that: a) the subproject eligibility criteria set forth in Section III.C. have been met; and b) the project neither duplicates nor conflicts with other AID or other donor activities in the country.

AID will carry out this review and approval process as early in the subproject identification and design stages as possible, in order to avoid substantial design efforts on subprojects which do not meet the basic project criteria. Nonetheless, AID may reserve judgment on some component of the subproject until the final design has been completed if there exists a possibility that subproject eligibility might be compromised during the design process.

In addition to this process of AID review and approval which will apply to all subprojects, for those subprojects involving more than \$1,000,000 in AID funds, REDSO/WA will review the Member States' final proposal in terms of its economic, financial, technical, and social feasibility and give its approval before the Entente Fund obligates funds for it.

G. Illustrative List of Subprojects

The following preliminary proposals have been submitted to the Entente Fund for funding under this project. These proposals will be evaluated by the Entente Fund. They will be either revised in accordance with subproject criteria as necessary, or rejected if they cannot be revised to conform to subproject criteria. Given the number of subprojects already submitted for program financing, the substantial design which has already been completed on most of these projects, and the degree to which EF/AID technical assistance personnel will be available to assist in the final design of subprojects, no major delays are anticipated in disbursement of program funds.

Based on the nature of the subprojects below, the major difficulty of conforming to subproject criteria arises with single-function projects such as storage or seed multiplication in that they may not be sufficiently linked to increases in actual production.

1. Benin

The Ministry of Rural Development and Cooperative Action (MRDCA) has requested a subproject concentrating on rice production in the Borgou and Atacora regions, two of the poorest in the country which contain nearly 30% of the population of Benin. The project would be implemented by the CARDER (see Institutional Analysis) of these respective regions under the tutelage of the MRDCA. The CARDER are financially autonomous structures charged with extension, distribution of credit and inputs and all the primary round of marketing. Normally CARDER carry out these functions through village-level cooperatives. Thus this subproject may represent an opportunity to strengthen the CARDER in these two regions, and assist them in institutionalizing an effective rice production project.

The subproject as submitted costs FCFA 507.52 million or about \$2.3 million. Increases in output are projected as follows:

RICE PRODUCTION

1976	14.828 MT
1977	17.775 MT
1978	25.480 MT
1979	27.580 MT
1980	30.136 MT

The Financial Plan outlined below gives a breakdown of the major expenditure items by year. Although the sub-project is projected over a five-year period, the Entente Fund may succeed in institutionalizing the process within three years through revolving credit funds, etc. The amounts indicated for fertilizer, seed and other inputs will be purchased through credit, and will not therefore be refinanced annually from project funds. Since the CARDERS act as the marketing agent, they can assure that the peasant receives a remunerative price. The CARDER may also recognize the

Summary of Financial Plan (millions of FCFA)

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>Total</u>
Seed	18.60	4.16	4.36	2.44	0.40	29.96
Fertilizer	50.72	17.04	22.96	10.08	--	100.80
Fungicide	1.40	0.31	0.33	0.17	0.03	2.24
Sacks	12.36	14.82	20.12	22.98	26.46	96.74
Store Houses	33.00					33.00
Tspt. Vehicles	64.00					64.00
Processing Operations	30.00	80.00				110.00
(trucks)	<u>11.20</u>	<u>11.20</u>	<u>11.20</u>	<u>11.20</u>	<u>11.20</u>	<u>56.00</u>
Total	221.72	127.53	58.96	46.88	38.09	492.74
+3% contingency	227.91	131.36	60.73	48.29	39.24	507.52

necessity of becoming involved with land tenure arrangements on a village level to encourage the itinerant farmers to invest in and upgrade the quality of their land.

2. Upper Volta

Upper Volta presented two separate subprojects: the first proposed financing for medium term credit through the BND (Banque Nationale de Developpement) to facilitate small farmer purchase of animal traction; the second proposed the establishment of a factory for the manufacture of equipment for animal traction through the Volta Valley Authority, accompanied by training in extension and the veterinary sciences to assure follow-up for the use of the equipment.

The cost of the medium-term credit proposal is \$1.6 million over three years, of which about \$64,000 would finance training of credit and extension agents; \$42,000 would cover vehicle and maintenance costs, and \$1.5 million would cover credit needs over a 3-year period after which revolving fund

would supply new demands for credit from past repayments. The project appears to respond to a pent-up demand for medium-term credit on reasonable terms. Present credit terms are on terms which only wealthy farmers can afford: 5½ %, 20% down, and three-years repayment with no grace period. Credit terms proposed under the project would be at 5.5%, one year's grace, with interest payments at the beginning of the second year, and four-year repayment. It is possible that even these terms are stiff, and that further flexibility should be built into the terms allowing for up to seven years repayment. However, if the possibility of buying young animals, and raising them for sale at the end of 3-4 years is built into the extension aspect of the projects, the farmers will be able to make enough to repay the loan and buy a set of young animals. The major possible area for concern with this proposal remains the linkage aspect: whether other elements such as production credit, input delivery and marketing mechanisms, are adequate to assure increases in food production and small farmers' incomes sufficient to repay the medium term credit.

The Volta Valley Authority (AVV) proposal is also primarily a single-function project, and will have to be integrated into other AVV projects to assure appropriate linkages. The proposal requests FCFA 50 million (\$225,000) for the manufacture of animal equipment, and FCFA 26.67 million (about \$120,000) for training of extension agents and veterinarians. While the premise of the proposal, that animal traction and mixed farming represent sound approaches to cultivation, is probably sound for Upper Volta, the sub-project designers should be cognizant of the existence of two similar factories in Bobo-Dioulasso and Ouagadougou: these factories have been operating at less-than-capacity owing to lack of effective demand for the equipment. Their economic and financial viability should be assured before a third factory is established.

3. Niger

Niger submitted two proposals: a farm mechanization project for animal traction, and a rice development project along the Niger River. The original farm mechanization project included \$10 million to subsidize purchases of the equipment, and \$5 million to support production costs and extension services. Although the project design team has rejected the concept of subsidizing the purchase of the equipment, and recommended a lower cost method of producing the equipment, the Nigerian government still places a high priority on the project. The final subproject design will be worked out through the Entente Fund.

The second component of Niger's proposal consisted of a \$3 million project to develop small pump irrigation units in inlets along the Niger River which flood during the rainy season. These small irrigated perimeters of 20-40 hectares would be cultivated by small farmers. The cost would include land leveling, diking, and 10 horsepower pumps to assure the supply of water. The low-cost technology approach and the small farmer-orientation of the proposal appear to fall into the purview of the project. An agronomist may have to be provided to test rice varieties in these and other conditions (bas-fonds and cuvettes) characteristic of traditional rice farmers in Niger. This expert would work in close cooperation with WARDA, the West African Rice Development Association.

4. Ivory Coast

The Ivory Coast proposed a three-part subproject to develop selected seeds. The order of priority the three components was cited as: 1) training of agronomists for adaptive research (\$700,000); 2) construction of warehouses for storage of multiplied seed (\$3,500,000); and 3) seed multiplication (\$350,000). Adaptive research and seed multiplication would be carried out in 10 institutes corresponding to the agro-ecological regions covering the entire country. The project in its present state of development does not link this effort directly to small farmer food production. It is also difficult to envisage the effect of the costliest portion of the project, 10 grain storage silos, each with a 10-ton capacity, on small farmer food production.

However, the concept underlying the project, which is the establishment of ten regional institutions which control all agricultural development efforts in their respective regions, including those of the semi-autonomous export crop development organizations, is intriguing. The Ministry of Agriculture is attempting to integrate food production into the development efforts of all of these institutions. In considering the above proposal, the Entente Fund may request to finance other portions of the overall project which relate more directly to small farmer food production. (See Appendix IV for original subproject proposal from Ivory Coast, and comments of the project design team.)

5. Togo

The Togolese government has sent no new proposal since the original proposal included in Appendix IV of this document. Entente Fund and design team discussions with Togolese officials indicated that there are numerous possibilities for subprojects including support to cooperatives of small farmers for food production. The UNDP assistance in the design of subprojects for rice production in three interior regions, and food production in the northern-most provinces which were singled out in the DAP for assistance constitute several possibilities which could be worked out by the Entente Fund and the Togolese Ministry of Agriculture.

IV. PROJECT SOUNDNESS ANALYSIS

A. TECHNICAL ANALYSIS

1. Technical Design of Project

The project has been designed to take into account the complexities of planning food production subprojects in the rural sector, and the limited capacities of Entente governments to perform this task. The technical assistance component of the project provides for a competent project management team which will work closely with local officials in each country at every stage of subproject design and implementation. Local AID officials may also collaborate in subproject identification and design to assure that subprojects are consistent with AID priorities and with other donor activities in each country. (see Section III.F.2).

The flexibility of the use of project funds within the context of small farmer food production projects contributes to the technical design of the project in several ways. First, the Entente governments bear the burden of assessing their priorities in the food production sector, in order to identify areas where subprojects would have a significant impact. Second, the technical feasibility of the identified subproject will be worked out in coordination among the Entente Fund project management team, host country officials, and local farmers, extension agents, credit institutions, marketing boards, etc. This process will assure that funds are allocated thoughtfully and efficiently. Third, periodic evaluations will assure that subproject funds are utilized flexibly and efficiently in light of changing conditions or reassessment of needs.

The technical organization of the project centers on the respective Ministries of Agriculture, Rural Development or Rural Economy in each Entente state. These ministries will coordinate the design and implementation of subprojects among their own personnel including extension agents, and other relevant organizations such as input delivery services, marketing boards, agricultural research organizations and local sociological research groups. The project management team will collaborate closely with the implementing Ministries in all phases of subproject design, implementation and evaluation.

The technical design of each subproject will be thoroughly assessed in accordance with the Subproject Analysis Framework outlined below.

2. Subproject Analysis Framework

The subproject analysis framework will be based on the analyses outlined below. This outline represents the basic format in which subprojects should be submitted to the Entente Fund for approval. The portions of the analysis which should be complete prior to approval for funding are indicated in Table E. For items not complete at that time, the analysis should describe the measures which will be taken to complete the analysis, and the expected scope or content of the analysis. Limitations of data and time may not allow

for thorough analysis of each item. However, it should be shown that each item has received sufficient attention from the project designers.

a. Description of subproject

- 1) Crops and regions which will be affected by the subproject
- 2) Implementing agencies

b. Beneficiaries of subproject

The number and description of small farmers in project areas should be indicated.

c. Role of women

Subproject analysis will include assessment of the role of women in food production and as community members in the subproject area. The analysis should include the projected effects of the subproject upon the roles and interests of these women including effects on income, influence on disposition of family income, time engaged in agricultural projection pursuits and other tasks, role in marketing of food crops, and effects of changed agricultural methods on women's roles. Efforts should be made to assess preferences of women in these matters if feasible, and to develop the subproject in such a way that women's productivity in food production is enhanced.

d. Land tenure system

The current land tenure system should be described, and assessed in terms of its impact on investments in the farm system. If the system discourages certain practices, changes in the land tenure system should be discussed at the village level and perhaps initiated on a trial basis if the farmers understand the rationale.

e. Analysis of farm systems

Description of current techniques of cultivation, crop rotation, use of fertilizer, and labor inputs (who, when, how much, at what cost).

f. Representative farm budget

The subproject design should identify the level at which an economically viable enterprise can be developed. This may be at the family farm level, extended family level, village level or cooperative level. At the viable level of organization, which at this stage of development may well be the family farm level, pro forma budgets should be prepared and periodically revised in light of operating experience.

The farmer level enterprise plan should examine cropping alternatives, animal traction, markets, costs and returns, and labor budget reflecting family and wage labor requirements, including an assessment of possible labor constraints on selected cropping patterns (e.g., a cost-benefit analysis at the farm level).

g. Risk analysis

For new technologies being offered to subproject participants, a risk analysis should be conducted and updated from time to time. This analysis will assess probabilities of financial loss associated with the new technology on various assumptions of farming conditions such as weather, timely delivery of inputs or marketing outlets.

The analysis may then assess the willingness of farmers to run these risks exploring such considerations as farmer views of credibility, extension personnel, risk and work aversion behavior and related factors.

h. Cost-benefit analysis of subproject

The technology promoted by the subproject should be low-cost, intermediate technology which is financially and economically viable at the small farm level. This type of technology, while labor-saving, should not displace labor, but render it more efficient. A cost-benefit analysis, prepared at the subproject level, should reflect the profitability of intermediate technology. (Note: Price Gittinger has published an excellent approach to the cost-benefit analysis of agricultural project, which is available through IBRD, 1818 H Street, Washington, D.C.)

i. Spread-replicability analysis

Subproject analysis will include an assessment of probable spread and replicability effects and constraints thereto. "Spread" in this sense means the influence of the activity upon contiguous areas around the subproject perimeter. "Replicability" means the possibility of adaptation of the subproject to other areas. In this connection, assessment of replicability effects to other countries in the Entente region may also be emphasized.

j. Farmer organization and participation

Assessment of existing and proposed organization structure, and mechanism whereby project maximizes small farmer participation in decisions affecting his interests.

k. Extension service: Organization and training for subproject.

l. Analysis of credit requirements of Subproject and capacity of credit institution to meet these requirements.

m. Analysis of input delivery system to assure proper inputs at reasonable prices, in sufficient quantities, and on a timely basis.

n. Market analysis

A marketing mechanism for expected increases in output should be assured (see Section III.E.2).

o. Technical feasibility analysis

Analysis of technology package supported by the project. Effect of subproject on soil fertility, conservation, land-use capability, and extent to which subproject relies on risky climatic conditions or rainfall.

p. Government support of subproject

This assessment will be two-fold: it will describe the nature and level of host country counterpart funding, and it will assess the commitment of the government to the subproject at the policy support level and the practical implementation level.

q. Baseline survey and periodic evaluation

Provisions for conducting a baseline survey and subsequent evaluations should be outlined. Sociological research groups, in collaboration with implementing agencies, will be the principal parties in carrying out these studies, with the assistance of the project management team and outside consultants as necessary.

r. Health effect

Possible side-effects of project should be assessed, particularly those of irrigation on lowland rice cultivation projects. Possible diseases should be addressed with provisions for remedies, such as anti-malarial medication or boots for schistosomiasis, etc.

s. Environmental effect

Possible environmental effects on the ecological system, the fertility maintenance of the soil through crop rotation, animal traction and the use of fertilizers, and other unforeseen environmental impacts should be thought through in the design of individual subprojects; alternative methods should be proposed to minimize any harmful ecological effects foreseen in the subproject; and the actual environmental impact should be evaluated periodically in accordance with the provisions outlined for evaluation procedures.

TABLE 11

Subproject Analysis Framework

	<u>Stage at Which Analysis Required</u>			
	<u>Prior to Approval of Subproject by AID *</u>	<u>Prior to EF Commitment to Fund Project **</u>	<u>Periodic Evaluation</u>	<u>Annual EF/AID Review</u>
a. Description of Subproject	X	X		
b. Beneficiaries of Subproject	X	X	X	X
c. Role of Women	X	X	X	X
d. Land Tenure System		X		
e. Analysis of Farm Systems		X		
f. Representative Farm Budget		X	X	X
g. Risk Analysis		X	X	
h. Cost/Benefit Analysis		X		X
i. Spread/Replicability Analysis	X	X		X
j. Farmer Organization and Participation	X	X	X	X
k. Extension Service	X	X	X	
l. Credit Requirements	X	X	X	
m. Timely Input Delivery System		X	X	X
n. Marketing		X	X	X
o. Technical Feasibility		X		X
p. Government Support	X	X	X	X
q. Baseline Survey & Evaluation		X	X	X
r. Health Effects		X		
s. Environmental Effects		X	X	X

* Required for all subprojects prior to AID review and approval.

** Required prior to AID review and approval of subprojects involving more than \$1,000,000 in AID funds

3. Appropriateness of Agricultural Technology

One of the major obstacles in designing rural development projects in West Africa is the limited research which has been done in the adaptation of improved technology to small farm conditions. This is due in part to the complexity of the nature of this type of research, given the myriad different "micro-conditions" that exist in the diverse agro-cultural systems represented in West Africa. It is also due to the slightly different orientation of past agronomic research in French West Africa, where IRAT stations located in each country have conducted research which attempts to maximize production under maximum fertilizer conditions rather than optimize production given local costs and conditions.

While the relative lack of small farmer-oriented research poses a major obstacle to the implementation of this project, the project design team is convinced that the declining state of food production in the region is in part the result of neglect of the food production sector, and resultant low investments in that sector. Higher producer prices, better marketing and storage mechanisms, increased access to inputs, and simple labor intensive technology can contribute at the present state of technological research to significant increases in production, especially when new inputs are considered as part of a total farm system. This systems approach to small farm conditions is a relatively new emphasis in the region, and will be stressed during the course of project implementation (see Subproject Analysis Framework, above).

Another important consideration in the development of small farm technology is the socio-cultural preferences of the participating farmers. Simple agronomic research does not always take this factor into account. Therefore, agronomic research in relation to specific project activities (e.g., specific crops in specific regions, in the context of overall cropping systems in that region) must be encouraged.

This project is designed to impact directly on agronomic research which is relevant to specific subproject activities. Members of the design team have discussed the problem of small farm technology with officials of several research organizations represented in the region. IRAT officials, both in the field and at Paris headquarters, have been contacted: while generally interested in the project's approach, IRAT officials in Paris indicated that their own research program has already been defined for the coming year, and that IRAT cooperation with project development would probably be limited to informal contacts. These contacts will be encouraged as much as possible with the purpose of encouraging IRAT interest in this area. Furthermore, IRAT has considerable experience with animal traction and farming system research at Bambey, Senegal, which will be relevant to subproject activities.

Officials from the International Institute of Tropical Agriculture at Ibadan, Nigeria, indicated that IITA is very interested in participating in project development, and in providing on-going consultation with the agronomic and technological components of individual subprojects. This is a major objective of IITA's new director, Bill Gamble, who previously worked for Ford Foundation. IITA currently has a staff of over 150, including over 90

researchers in all aspects of tropical agriculture. About 32 researchers work specifically on farming systems; 11 on cereal improvement, nine on root and tuber improvement; and 24 on grain legume improvement. These experts would be available on a short to medium term consulting basis for subproject development. Given their already considerable knowledge of African farming systems, their contribution to the project will be invaluable.

ICRISAT is also beginning to place researchers in West Africa. A sorghum and millet expert in Upper Volta is currently in the process of testing 2,000 varieties of sorghum, and 1,500 varieties of millet under rain-fed conditions. This expert has indicated a strong interest in collaborating with field trial officers funded by this project to adapt the more responsive varieties to small farm conditions in different regions in Upper Volta.

While design team members were not able to contact officials from WARDA (rice research) in Liberia and the Samaru research station for semi-arid agriculture in Nigeria, it is hoped that the project management team can elicit their expertise and cooperation in the project.

The research network for the major food crops grown in the Entente region is depicted in Table F. The Entente Fund and the participating governments will coordinate and promote relevant research needs through this network.

Thus one of the outputs of the project will be the identification of viable small farmer minimum input packages. It is hoped that the project will impact broadly on agronomic research in the region by 1) drawing attention to the need for research relevant to small farmer technology packages; 2) encouraging national research organizations in the Entente states to emphasize this type of research; 3) training two agronomic researchers in each country in relevant skills; and 4) playing a coordinator/catalyst role in organizing conferences and seminars in the region.

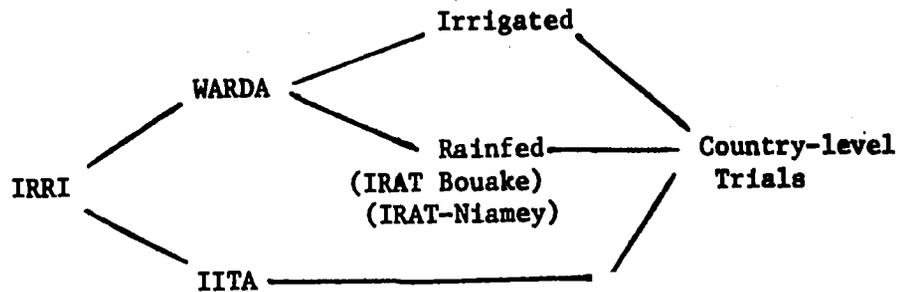
4. Environmental Assessment

The environmental impact of the proposed project is essentially twofold. First, the project will impact on farming systems through the adoption of new technologies. The environmental impact at this level will be predominantly favorable: it will contribute to a reduction of erosion and of fallow periods by introducing methods of maintaining soil fertility through crop rotation, animal traction and the use of fertilizers. These improvements in farming techniques are expected to have a favorable impact on agricultural eco-systems as a whole.

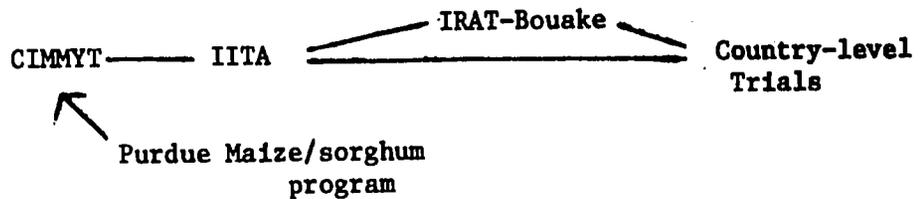
A second environmental impact of the project might occur through irrigation projects or lowland rice cultivation. Soil erosion effects will be minimized through the introduction of diking techniques. However, the health implication of stagnant waters in the tropics or sub-tropics are numerous, and will be addressed in the course of subproject design.

TABLE 12
**Research Networks
 for Entente Food Production Projects**

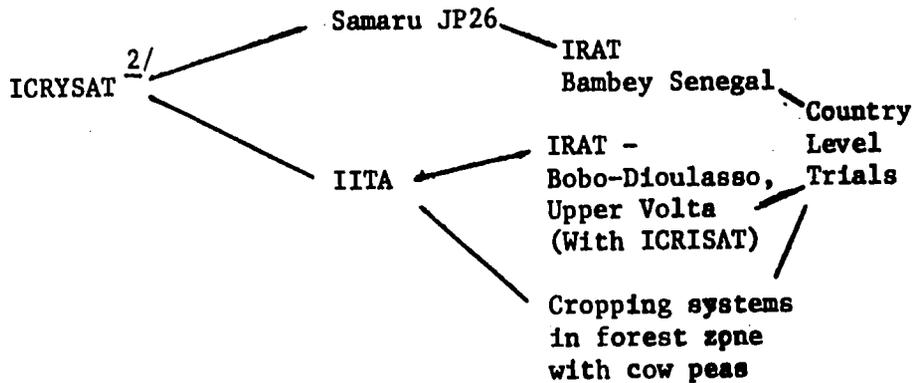
Rice^{1/}:



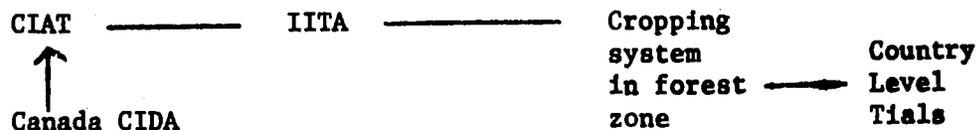
Maize^{1/}:



Sorghum/Millet:

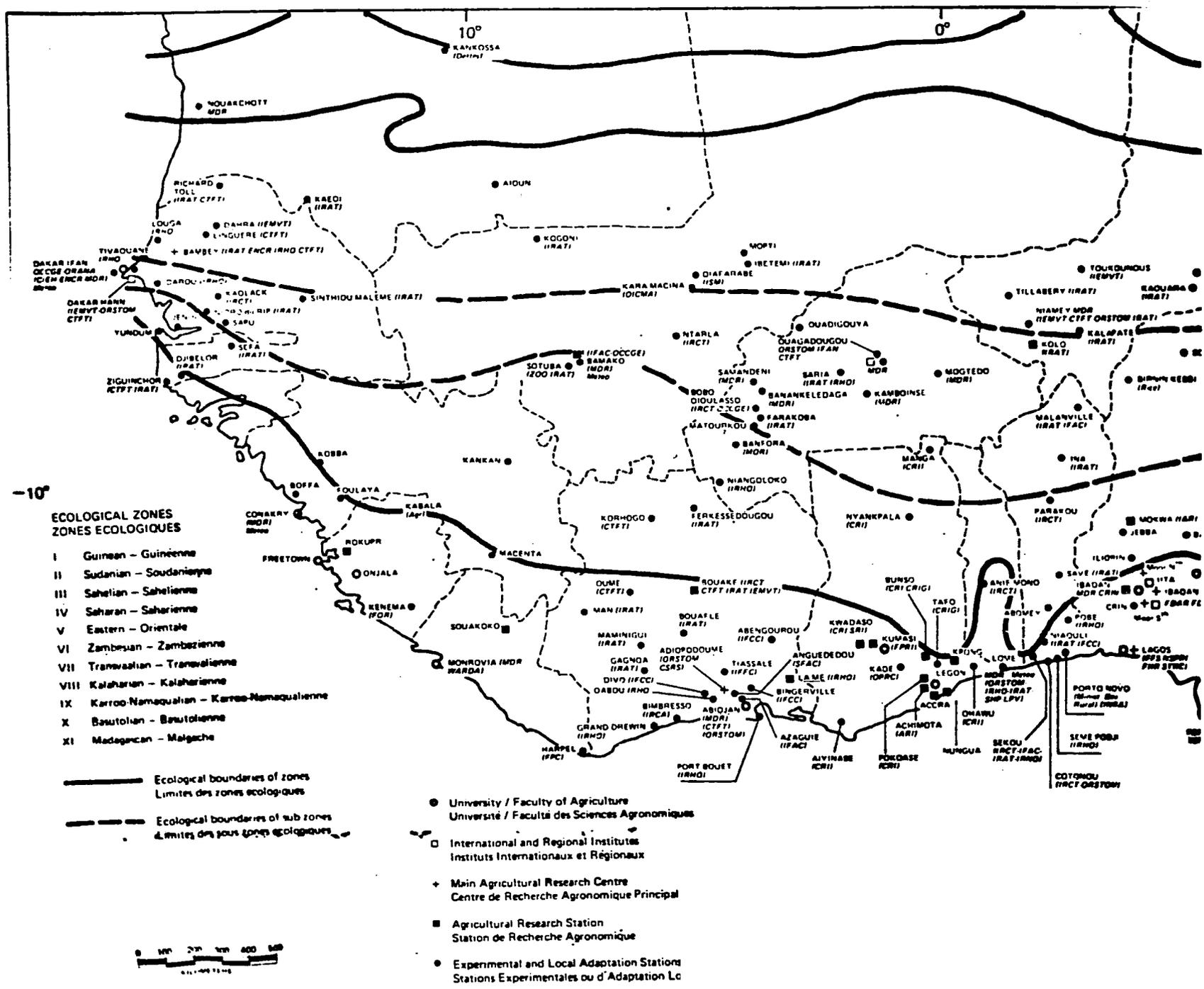


Cassava:



1/ Note: In FY 1976 IITA will start courses in French on rice and maize.
 2/ International Center for Research on the Semi-Arid Tropics in Hyderabad, India

TABLE 13 : AGRICULTURAL RESEARCH CENTERS IN AFRICA SOUTH OF SAHARA



B. SOCIAL SOUNDNESS ANALYSIS

1. Beneficiaries of Project

a. Small Farmers

The primary beneficiaries of the project will be the small farmers and their families who will be reached through specific subprojects. A profile of this small farmer can be given only in general terms, since subprojects areas have not been adequately defined to permit baseline studies.

The status occupied by small farmer families in the economies of the Entente states is indicated in Table G, below:

Table 14: Summary of Basic Small Farmer Data

	<u>Dahomey</u>	<u>Ivory Coast</u>	<u>Togo</u>	<u>Niger</u>	<u>Upper Volta</u>
Population supported by agricultural sector	55%	81%	85%	91%	89%
National per capita income (1972)	\$103	\$424	\$170	\$120	\$70
Per capita income in agricultural sector <u>1/</u>	\$50	\$125	\$70	\$60	\$31
of which monetized income <u>1/</u>	\$24	\$80	\$24	\$19	\$12

Source: IBRD Reports

1/ Rough estimates for Dahomey, Ivory Coast, Togo.

It is clear from the table that the average farmer in these countries constitutes a member of the poor majority. In the coastal countries, the average incomes of the target population will be lower than those suggested in the table, since subprojects are planned for the northern areas which are poor regions in comparison to the national average.

As in all economic systems, there are relatively more efficient and relatively less efficient producers, who correspond to relatively better off and relatively worse off groups. This project will not make a specific attempt to reach the poorest of the poor. Instead the project will attempt to reach those who are most willing and capable to experiment with technological innovation and to assume the accompanying risk. Until the average level of farm incomes is significantly higher in this region, any attempt to focus on the poorest element of this poor majority appears to be a luxury which the Entente countries can scarcely afford given pressing food production needs.

b. Women in Rural Development

Traditionally, women play a crucial role in food production in most parts of Africa. In fact, nearly all food production for subsistence purposes is done by women in many areas, while the men are occupied with cash crop production. What little excess food women produce provides an important source of income, since women are generally responsible for feeding and clothing their children.

The designers of rural development projects have long ignored the role of women in food production, as well as in other aspects of agricultural production. Extension services have been uniquely oriented towards the male half (or often less than half, given the realities of rural-urban migration) of the agricultural labor force. Not coincidentally, extension services have also concentrated primarily on cash crops. Thus the productivity of men in agriculture has increased, while the productivity of women has stagnated. The implications of this trend for food production are enormous.

Credit services have also been denied to women cultivators, largely because it has not occurred to project designers that women might make efficient use of credit. In some areas, proof of title to the land might be a requirement for credit: if the title is in the name of the man, and he has migrated in search for work, clearly the woman will be denied credit. Alternately, a man may not be willing to assume responsibility for credit for several wives. Since men and their wives tend to be largely economically independent of each other, it would seem logical that investment opportunities should be offered to both economic entities.

The role of women in agriculture is complex, and constitutes one more element of the micro-conditions which must be analyzed in designing rural development projects. Women, as an integral part of traditional farm systems, may have effects on decisions which appear to have little relationship to women. Reluctance to invest in animal traction equipment in Upper Volta may be a logical choice for a male who views the trade-off as his wives' labor against his own leisure, since culturally women are not allowed to walk directly before or behind animals, and physically they may be considered too frail to handle animals or plowing equipment. Thus the role of women in agricultural production must be analyzed on an individual case study basis.

In a recent evaluation of rural development projects in Africa, a group of sociologists ^{1/} noted the lack of project components addressed to women's needs in agricultural production. Women in some areas have requested assistance in increasing their productivity in food production. Given the hard work that rural women in Africa perform, from carrying water and firewood, to agricultural production in both food and cash crops, to feeding and clothing their children, increasing their efficiency through participation in food production projects appears to be highly justifiable.

^{1/} Messrs. Gentil and Belloncle from I.R.A.M., Paris, in a study of an integrated rural development project in Cameroon.

The marketing role of women is also an area of potential importance, and may prove to be useful in the design of some subprojects.

The Subproject Analysis Framework, present above in Section IV.A.2, provides for an analysis of women's roles in each of the subprojects which will be funded under this project. Subprojects should include women as eligible participants in any activity of interest to them; in fact, women may well be the principal participants in some components of subprojects relating to food production techniques. However, cultural and customary barriers are likely to exist in most areas, if only because it has seldom occurred to project designers or to government officials to address the agricultural production role of women. Therefore, the design of programs addressing women must be the fruit of dialogue with both men and women in project areas.

c. Consumers

The ultimate consumer will be an indirect beneficiary of the project. To some extent, this beneficiary is likely to be the small farm family, since at very low levels of income, a significant portion of increases in food production tend to be consumed by the family. Urban dwellers will ultimately benefit from increases in food production by having access to a more reliable supply of food grains at reasonable prices.

2. Social/Cultural Feasibility

a. Interest of Africans

The project addresses one of the most rampant needs faced by Africans on both a micro- and a macro-level. Small farmers in Africa are essentially subsistence farmers, and food production constitutes the basis of their subsistence. Therefore, the inherent interest of African farmers in any project which will increase productivity in food crops is substantial. The interest of Africans at the policy-making and implementation level is also substantial, as evidenced in food import statistics and as demonstrated by the November meeting organized by the Entente Fund for key Ministry of Agriculture officials from each Entente state.

An essential element in the transformation of this interest into successful subprojects which satisfy both the small farmers and government officials is the design/collaboration process which maximizes the acceptability of subproject elements to the participating farmer.

b. Acceptability of Project to Participating Farmers

No rural development project can guarantee social/cultural feasibility: in every instance, the success of a rural development project depends on the degree to which farmers recognize benefits to themselves from participation in the project.

AID recently contracted a study of 36 rural development projects (Strategies for Small Farmer Development by Development Alternatives, Inc.)

to determine how to improve the design and implementation of projects addressing small farmers. The primary findings of the study were that to maximize the chances for project success, 1) the small farmer should be involved on a meaningful level in the decision-making processes which affect him and 2) the small farmer should be persuaded to make a resource commitment to the adoption of new technologies. These two variables explained nearly 50 percent of the differences in project success scores among the 36 projects.

The social/cultural feasibility of the subprojects ultimately depends on the degree to which the subproject elements are acceptable to the small farmer. This in turn depends on the sensitivity and collaboration with which subprojects are designed and implemented. The Subproject Analysis Framework (Section IV.A.2) designates farmer participation as a key element in the design of subprojects. This element will be examined in a periodic evaluation at the level of each subproject. Farmer commitment of resources is also an inherent part of subproject development, since subsidies are not eligible project costs, and credit will be made available for the purchase of inputs.

Thus the technical procedures for designing subprojects emphasize the importance of small farmer participation and acceptability. It is hoped that the social/cultural feasibility of the project, which coincides with small farmer acceptability, will be assured by sensitivity to the appropriateness of technological innovations, the concern and collaboration of extension agents, adequate infrastructure for input delivery and marketing, and the applicability of sociological research findings in annual evaluations.

3. Spread and Replicability Effects

The design of individual subprojects will take into account possibilities for spread and replicability effects. Since basic food crops tend to be similar over large areas in the Entente countries, there is likely to be a high potential for spread and replicability effects. These effects will be evaluated on a project by project basis in the context of the Subproject Analysis Framework.

Social spread effects are expected to occur on both individual and collective levels. On an individual basis, spread effects will stem directly from increases in food production, hence in consumption and income, for small farm families. Social spread effects on a collective level will stem from 1) increases in national food production, which should decrease the level of food imports; 2) improvements in income distribution as rural sector incomes increase; and 3) improvements in the quality of life in the rural and urban sectors as incomes and consumption increase. The project may also impact on the rural-urban migration rate through the expansion of income-earning opportunities in rural areas.

4. Development of National Capabilities

An important long-term benefit of the project is the national capacity of the Entente governments to identify, design, implement and evaluate rural

development projects. This capacity will enable them to exert increased influence on development projects designed by other donors, and to improve the quality of domestically funded and designed rural development efforts. The project should contribute to the expansion of rural development planning skills at several levels, including project design and implementation, small farmer-oriented agricultural research, sociological research related to rural development, and overall evaluation of rural development projects at every level.

C. Institutional Analysis

1. The Entente Fund

The Mutual Aid and Loan Guaranty Fund of the Council of the Entente (the Entente Fund) was established in 1966 by the governments of the Entente Council (Ivory Coast, Niger, Upper Volta, Benin, and Togo). In recent years the Entente Fund has become an economic development institution which has served as a vehicle for channeling AID and other donor assistance to the five Entente countries. The principle objectives of the Fund are to: 1) provide a Guaranty Fund to encourage investments in the member states; 2) foster increased trade, commerce and investment between the Entente countries and their neighbors; 3) promote economic integration in the region; and 4) develop specific projects and obtain assistance from donors.

The 1966 convention creating the Entente Fund provides for a Secretariat headed by an Administrative Secretary. At the present time the Administrative Secretary, the only African on the staff, is assisted by a staff of four donor-financed advisors, three French and one American. These advisors perform the essential management and technical tasks of the Fund, including financial management and budgetary control. They also advise the Fund on agricultural matters and other economic development matters in the Entente nations.

The small staff of the Fund is currently responsible for the operation of the following FAC, FED, CIDA and AID-financed programs, several of which are jointly funded: a regional training center for road maintenance in Togo; several telecommunications projects; a livestock center, the Entente Livestock Community (ELC) in Ouagadougou; a Regional Cereals Office in Niamey; and a Program of Assistance for African Enterprises in Abidjan.^{1/} These centers, which have operated with varying degrees of success, are intended to serve as sources of technical expertise in their respective areas. To provide management for these specific development projects, the Fund recruits special personnel on a contract basis. Policy matters for these projects are handled at the level of the Administrative Secretariat, occasionally with inputs from contract personnel.

Despite its initial successes with a small staff, it is now apparent that an expanded staff capability is essential if the Fund is to act as more than an administrative conduit for the larger level of grant and loan funds that is now contemplated, particularly when those activities are to be in the more complicated agriculture sector. In recent design efforts, the Fund has had limited inputs because its staff is preoccupied with the management of on-going projects, and other activities. The problem is particularly acute in the area of agriculture, where one expert handles all technical and policy aspects of livestock, cereal stabilization and food production in each of the Entente

^{1/} See Appendix III for a list of donor-funded Entente projects.

States. All of these areas are immensely complex from a development point of view, especially when one considers that five different nations and numerous donors are involved. As long as the Fund remains small, its primary capability is destined to be in management rather than technical, operational matters.

Despite its involvement in economic development activities, the Entente Fund is essentially an implementation organization carrying out the mandate of its Council of Ministers from its five member states. Its potential development role must be measured against this limitation, since it is unable to defend a point of view which might conflict with possible political interests in any of the Entente States.

In light of the above limitation, the most efficient formula for the implementation of the present project is through the addition of competent technical personnel to the staff of the Entente Fund to work uniquely on this and related AID projects. This formula for implementation has been extremely successful in the Entente African Enterprise Loans. There is potential for close coordination of this project with the AID-funded Entente Livestock Loan II and the Entente Grain Stabilization Loan.

Therefore, within the Fund, the main responsibility for the Entente Food Production Project will be delegated to a project management team specifically recruited for the project. This team, with the assistance of other technical personnel of the Entente Fund and consultants provided through special technical assistance funds, will provide the technical and managerial expertise required for the project. This arrangement will complement the exceptional administrative capacity of the Entente Fund to implement projects, which in the past has been demonstrated by other AID projects.

2. The Entente Member States

The institutional capacity of the Entente States to design and implement small farmer food production projects appears to be limited, although these capacities vary within the region. Traditionally, agricultural production has been promoted through semi-autonomous societies which are concerned uniquely with one crop, or through state-controlled cooperatives. Hence the capacities of the agricultural ministries have benefitted little from the organization and implementation of rural development projects. Furthermore, food production in general has been relatively ignored in favor of export crop production.

Therefore, a major purpose of this project is to develop the capacities of the Entente states to identify, design, implement and evaluate rural development projects. By eliciting close cooperation between local officials involved in rural development and experts provided through the Entente Fund, the project will serve as a training ground in rural development for the Entente member states.

A brief description of the institutional structure and capacity of each Entente country follows.

a. Ivory Coast

Agricultural Development Agencies: For implementation of development policies the GOIC relies on autonomous development societies (Sociétés de Développement Autonomes) set up and financed by the government for the development of one or more specific crops. Normally they work in close cooperation with a French semi-public research organization. For example, the Société d'Assistance Techniques pour la Modernisation de l'Agriculture de la Côte d'Ivoire (SATMACI) was founded in 1958 to carry out development programs for cocoa and coffee. It works closely with the French applied research organization (IFCC). The Société pour le Développement de Palmier à Huile (SODEPALM), established in 1963 to carry out development activities with oil palm, works closely with IRHO. The Compagnie Française pour le Développement des Textiles (CFDT) is a French development firm functioning throughout francophone West Africa and working closely with the French research organization IRCT.

Until 1970 there was no development agency with responsibility to promote development of rice cultivation. At that time the Société pour le Développement du Riz (SODERIZ) was established with close relations with IRAT. While IRAT has not previously had an active program of research on cereal crops in the Ivory Coast, it has a long history of research on important food crops in Western Africa and much of that work is relevant to the production problems of cereal crops in the northern Ivory Coast.

This system of autonomous development societies, with each society concerned with only one or two commodities, has been effective in dealing with important export crops. It is not likely that this arrangement would work well where appropriate farming systems require integration of several crops in a rotation. It would be wasteful, and confusing, to have several agencies trying to work at the farm level for the various crops.

Agricultural Credit: With the failure of the former agricultural credit institution, CNCA, because of excessive number of defaulters, the GOIC established the "Banque Nationale pour le Développement Agricole" (BNDA) in 1969. The BNDA was structured to avoid the worse problems of the defunct CNCA and is expected to expand its lending operations rapidly. It projects an increase in loans granted from 2.071 million CFA in 1970 to 11.0 million CFA by 1975. However, it does not seem that its present structure and lending policies will make it a very effective channel for credit to the small food producing farmers. BNDA makes three types of loans:

- 1) loans to large individual companies or semi-autonomous agencies for farm development;
- 2) loans to crop cooperatives to finance marketing of members' produce;
- 3) loans to individual farmers (or state societies) to finance pre-harvest requirements.

The repayment period for the first two types of loans is from two to ten years at interest rates varying between five and a half to eight percent. Loans of the third type are to be repaid at the end of each growing season. The rate varies from five and a quarter to nine percent.

The following securities are required for all loans to individual farmers:

- 1) A mortgage on land and engagement to sell export crops and rice through a recognized marketing channel which deducts payment for all loans over CFA five million;
- 2) for loans under CFA five million, an additional requirement is collective guarantee of a number of farmers of the village; default by one farmer means all the rest are barred from further loans. Defaulters from the defunct CNCA are also barred.

These terms, while they may help insure BNDA's financial viability, do not seem well adapted to the credit needs of the typical small subsistence farmer.

Agricultural Training: The Ministry of Agriculture is responsible for education and training in agriculture including, until recently, veterinary and livestock workers. The ministry carries out the training at the professional level directly, whereas the various specialized development societies carry out the farm level training on behalf of the ministry.

The Ministry has greatly expanded its training facilities and student capacity in recent years. The number of schools increased from three to seven between 1960 and 1970 and the student capacity increased from 140 to 520. The level of training ranges from secondary school level to the Ingénieur Agricole level. We understand that the total number who have thus far been trained as agronomists at the Ingénieur Agricole level is only 60 and the current turnout is ten each year. However, the capacity is soon to be increased with an estimated turnout of 30 to 40 per year, three or four years from now. At that time they may be able to start replacing much of the expatriate personnel that now dominate the planning units, the autonomous agricultural development societies and the research organizations.

b. Benin

Agricultural Development Institutions: Until recently extension work has been carried out by SONADER in the south and by semi-public French companies in the north (CFDT-Borgou region, SATEC-Zou region, BDPA-Atakora region). Extension personnel are trained mainly for specific cash crops (cotton, palm oil). In recent years this system has been heavily criticized, as general rural development has been effectively neglected. The CARDER organizations have been created in order to consolidate rural development planning and probably implementation (including extension work) in a single regional organization.

The GOB recently held a major planning exercise in which they are said to have developed a new agricultural plan and organizational structure. This plan has not been made public. However, rural development will be a top government priority and government administration will probably be decentralized with decreased influence by vertical one-crop "Societes." Rural development programs will be planned and possibly implemented by regional CARDER (Centre d'action Regional pour le Developpement Rural). At present CARDER exist for only the Mono and Atakora regions.

According to the government planning agency (attached to the Presidency) at least four major projects are being prepared: 1) Development of food crops in Benin; 2) Rural development in the Atakora region (the President's home region; 3) Rural storage, and 4) Strengthening of the agricultural extension network and the rural youth program (includes the 4-D program). In addition, the Livestock Service hopes to increase the use of animal traction and increase peasant finishing of cattle used for traction. Since there are 16,000 oxen presently being used for traction, this would provide 4,000 to 5,000 head for slaughter/year at 200 kg. carcass weight, compared with 110 kg. weight from traditional herding. The goal of the program is to increase the numbers of cattle used for traction (two pairs per farmer rather than one at present) and eventually slaughter.

Marketing: While cash crops have been marketed through various public and private companies, food crops are marketed at the farm level through traditional methods and channels at prices which hardly stimulate farmers to increase their production. The government has encouraged the growth of cooperatives which could eventually market produce. Although the cooperative movement in Benin is still very young and conclusive results are not yet available, several donors are discouraged by progress thus far achieved.

Agricultural Research: IRAT, the primary agricultural research organization in Benin, is presently doing work on the means to replace slash and burn type agriculture with permanent farms and farming techniques which would prevent deterioration of soils. In the face of rising fertilizer prices, they feel this can be done only if fertilizer is subsidized. IRAT has also conducted research on cereal yields using phosphate mined in Togo

and has carried out trials which stress proper spacing, time of planting, etc. They feel that seed multiplication is a problem, especially for corn. While their estimate may be unrealistic, they see a need to increase seed multiplication capacity from ten tons/year at present to 1,000 tons.

c. Togo

Agricultural Development Institutions: In 1967 the government established five "Sociétés Régionales d'Aménagement et de Développement" (SORADs), one for each of the five administrative regions. Each SORAD was made responsible for the development programs within its region. The SORADs are expected to provide extension services, implements, seeds, fertilizer, insecticides, etc., and to act as intermediaries between credit institutions and the farmers.

It is now generally agreed that the SORADs have not been very effective in helping the farmers. FED is now emphasizing, with GOT approval, support for commodity groups such as SOTECO (cotton), SOTEGRAN (cereals), etc. These commodity groups have to carry out programs broad enough to include the major crops in a rotation within a region. For example, SOTECO is concerned with food production as well as cotton.

Two new developments may improve the situation:

- 1) UNDP has started a rural development planning unit, which should provide guidance on priorities and development planning; and
- 2) IBRD is considering a rural development project in the Maritime region. If this develops, it can be expected to set up a regional development organization that is likely to be effective, and which could be used as a model by other donors.

At present, the support of the Dapongo and maritime regions has been from FAC. Makar has been supported by UNDP and central and plateau regions by FED. As mentioned earlier, IBRD is considering an intensified program for maritime region. FED is planning to support SOTECO with the Blao (Atakpame) project, which will also involve training of Togolese "encadreurs" to promote the production of food crops. Cotton is a recent introduction in Daphonga region.

The SORADs multiply the commercial seeds of food grains but there is need

- for IRAT to include a wider spectrum of varieties for multiplication,
- for field testing of varieties in each region at levels of fertility used by farmers^{1/},
- for multiplication of the elite seed (last year IRAT was short of seed).

^{1/} FED has contracted with IRAT to do local trials on two locations in Plateau and one in Central region. There has been some success in maize and manioc but little in sorghum/millet.

The present schemes for multiplication of commercial seeds is foundering due to lack of new varieties suitable for adoption by farmers.

FED has been trying to develop a livestock program. It has agreed to improve veterinary service delivery and to make sure mineral supplements in Togo. There is need for well bred Taourin bulls to produce oxen large enough for work. In the proposed program for animal traction, FED will give a grant for each pair of oxen and each cart placed on a farm.

Agricultural Research: The Ministry of Rural Economy has a research unit with divisions which include 1) soil studies; 2) nutrition and food technology; 3) socio-economic studies; 4) agronomic research; 5) livestock research, and 6) relations with foreign research institutes. The Research Unit has a staff of 15 professionals. Research by IRAT in Togo has to this point been adaptive rather than basic. They currently have research programs at 11 stations in Togo. Most of their work has been with fertilizer trials and improved cultural practices.

Agricultural Credit: The Caisse Nationale de Crédit Agricole (CNCA) was established in 1967 to provide credit through the SORADs for financing purchase of equipment and inputs and land development. The Office des Produits Agricoles du Togo (OPAT), a marketing organization for cash crops, also provides subsidies and loans to the SORADs.

Marketing of Food Crops: Because of the persistent decline in food production there has been a recent shift in development strategy to encourage production through higher producer prices and subsidized inputs. The new policies include price increases ranging from 25 percent for manioc to 52 percent in the case of rice. In order to regulate the supply and prices of foodcrops a public agency, the Togograin, was established in 1973/74. Togograin is supposed to buy food crops at harvest time when domestic prices are low and sell them when prices are high in order to reduce the price levels. There are difficulties in doing this effectively near the borders as long as prices in neighboring countries are competitive. At the present time Togograin is handicapped by a lack of storage facilities. It has the capacity to stock only 3,500 tons of maize in the south and 3,000 tons of millet in the north.

d. Niger

Several Nigerien institutions assume primary responsibility for the agricultural development of Niger: the Ministry of Rural Economy, Environment, Climate and Population Assistance; the Union Nigerienne de Crédit et de Coopération (UNCC); and National Fund for Agricultural Credit (CNCA). The Niger Development Bank (BDRN) was established in 1961 as a commercial and development bank for all economic sectors, and for private as well as public enterprises.

The Ministry of Rural Economy: The Directorate of General Agriculture is one of the four directorates of the Ministry of Rural Economy, the others being: Livestock and animal industries, water resources and forests, and civil works. The functions of this directorate are defined by Decree No. 8/MER of June 22, 1966:

- to organize, improve, and increase production;
- to perform the technical preparation of agricultural development plans, and supervise their execution;
- to protect crops through phytosanitary inspection, and control of packing and storing of agricultural products;
- to teach farmers modern agricultural techniques;
- to work with cooperative and marketing agencies to improve the quality of agricultural production.

The directorate staff totals 179 and includes four engineers, 12 agricultural advisors, 29 "conducteurs de travaux agricoles", 23 "agents techniques d'agriculture" and 111 "moniteurs". The directorate is decentralized in seven "departments" and 30 "arrondissements" of the country, and in 148 agricultural units headed by a "moniteur" (extension worker) at the village level. Each unit serves about 20,000 to 30,000 people or 3,000 to 4,000 farmers.

The results of this very low ratio of extension workers to farmers have been poor. The main achievement to date has been farmer acceptance of fungicides for seed dressing. Some 17,000 tons of fungicides were sold in 1972, enough to treat about 50 percent of available groundnut seeds. The use of fertilizers, however, is practically non-existent (435 tons in 1971 and 380 tons in 1972).

Union Nigerienne de Crédit et de Coopération (UNCC): UNCC is a parastatal organization, with a board of 20 directorates and a managing director who is appointed by the Council of Ministers. It was established in 1962 and reorganized in 1967, when its banking and credit activities were transferred to Caisse Nationale de Crédit Agricole (CNCA). Its financial position is weak, as short-term liabilities exceed short-term assets and are far in excess of equity and long-term borrowing.

UNCC's functions as defined by the law of 20 September 1967 are:

- 1) to promote the establishment of cooperatives and train their representatives;
- 2) to assist cooperatives in marketing their production and in providing farm inputs;
- 3) to provide cooperatives with technical assistance; and
- 4) to manage irrigation schemes and other Government projects.

UNCC employs 334 people, including 112 extension workers. Less than 15 percent of the staff have civil servant status; the remainder have been hired under UNCC terms of employment. There are a total of 16 French technical assistants financed by the French aid program.

UNCC has three divisions: administration, cooperatives, and production. The cooperative division is responsible for the creation of new cooperatives and, together with "animation" and "alphabétisation", for training farmers. It keeps accounts for the cooperatives and supervises the cooperative education and mutual guarantee funds. It arranges financing for crop marketing, partly using cooperative savings deposited with it and is the middleman between cooperatives and marketing agencies.

The production division is responsible for cotton production in the country. Compagnie Française pour le Développement des Textiles (CFDT) has provided it with technical assistance since 1964. In 1974 UNCC had 41 extension agents in cotton areas, for 405 villages and a total population of 293,000 people. Virtually all cotton-growing areas are covered. Cotton production increased regularly until 1971, when it reached 9,000 tons of seed cotton. Since then it has decreased every year to 4,900 tons in 1973 owing to poor rainfall. The country's production potential is estimated at about 20,000 tons.

Caisse Nationale de Crédit Agricole (CNCA): CNCA is 100 percent government owned. It has a Board of Directors of 20 members (the same as UNCC's): the Ministers of Rural Economy, Finance, Interior, Economic Affairs, Economic Development; the President - Director General of BDRN; the Directors of BCEAO and Crédit du Niger, three deputies at the National Assembly, seven representatives of cooperatives, and the President of a government import-export corporation. The Director of CNCA is appointed by the Council of Ministers. CNCA accounts are kept in accordance with commercial banking practices. The Ministry of Finance carries out an audit on the GON's behalf.

CNCA has a staff of ten at headquarters in Niamey and is represented by UNCC agents in the seven districts.

CNCA has no share capital; its permanent resources are government grants totalling CFA 170 million (US \$680,000) at present. Another source of financing has been current and short-term deposits by government-owned corporations, which reached a peak of CFA 400 million (US \$1.6 million) in mid-1972.

CNCA operations have included a) medium and short-term loans to finance agricultural production development; b) short-term advances to UNCC to finance primary marketing of groundnuts, cotton and rice; and c) short-term loans to other government and semi-public corporations to finance the marketing of different agricultural products.

Agricultural Research: The French-sponsored research organization, Institut de Recherches d'Agronomie Tropicale (IRAT), which operates a network of agricultural research stations throughout West Africa, carries out the principal agricultural research programs in Niger. Its research program is conducted at two principal research stations at Tarna (near Maradi) and at Kolo (near Niamey) and at four sub-stations at Magaria, Kawara, Kale-Pote and Sumiri. Also, it carries out field trials at 30 locations in the various departments: eight in Niamey Department, four in Bosso, five in Tahoua, four in Maradi, five in Zinder and four in Diffa, thus giving a broad geographic distribution of the tests in the major ecological zones.

IRAT also cooperates with the West African Rice Development Association (WARDA) in its program. It has established liaison with other French research organizations working in West Africa and with the various international research institutions: IITA, ICRISAT and IRRI, as well as with the A.I.D. and OAU/STRC-sponsored Major Cereals Project at Samaru, Nigeria.

The research program covers a wide range of activities, including climatology studies, soils and soil fertility studies, irrigation, and plant breeding and cultural practices for the following crops: millet, sorghum, corn, wheat, rice, niebe (cowpeas), peanuts, forage crops and sugar cane.

The research facilities are well staffed, primarily with expatriate scientists, and suitably equipped.

The other important research facility is the Canadian (CIDA) sponsored laboratory for research on plant insects and diseases located at Maradi, adjacent to the Tarna research station of IRAT. This well equipped facility has a small expatriate staff in entomology and plant pathology. Some Nigerien staff has been selected for advanced degree training abroad to take over the operation. The research program, which is just getting under way, is maintaining close liaison with the plant protection unit at Niamey, also being sponsored by CIDA. The Maradi station is collecting and studying specimens of the insects which were most damaging to this year's millet crop (head worms and stalk borers) which are estimated to have reduced this year's millet crop by at least 15 percent. The station conducted short courses for extension field staff to acquaint them with the insects of economic importance and symptoms indicating disease of pest outbreaks so they could alert the Niamey unit of situations requiring prompt control measures.

The existing research system has produced results which, it appears, would, if adopted, increase cereal yields substantially and make more effective use of resources. Rate of adoption of the recommended varieties and practices has been low, however. This may be partly explained by ineffective extension work, lack of credit or other constraints. In the opinion of some, more effort should be put on adaptive research to rapidly evaluate the complete package of plant materials, cultural practices, soil fertility improvement, pest control, etc., as the basis for seed multiplication, field demonstrations and extension programs. The Niger National Cereals

Production Project (NNCIP) now being developed by USAID in cooperation with GON is expected to develop this package. UNDP is considering a proposal for contracting with ICRISAT to provide stronger linkage with the research organizations in Niger and other West African countries and to expand and improve the field testing of potentially better varieties and practices.

e. Upper Volta

Agricultural Development Organization: The GOUV, in 1965, adopted as a strategy for development the creation of independent and self-accounting "Organismes Régionaux de Développement" (ORDs). Since then, ten ORDs have been established and the eleventh, the Sahel ORD, covering the remaining territory, is in the initial stages of being established. The individual ORDs are responsible for planning and carrying out development programs within their geographically defined areas, within the framework of the national rural development policy.

The GOUV provides each ORD with staff, buildings and equipment for minimum operations. Each ORD can recruit additional staff and expand its facilities if it can generate the additional funds. Each ORD is managed by a Director, appointed by a decree of the Ministry of Rural Development. The Director reports to a local steering committee which has been designated by a larger group, the ORD assembly.

Of the ten established ORDs, all except Eastern ORD or Fada N'Gourma have benefitted from external financing. AID has only recently made a commitment to support an integrated rural development program in Eastern ORD. The French government (FAC) and the European Common Market (FED) have been the principal sponsors financing development programs in the ORDs in the past. More recently, IBRD has provided support to three of the ORDs and the Canadian government (CIDA) is supporting one ORD.

The sponsoring agencies, particularly FAC and FED, have normally contracted with foreign companies to provide the technical assistance and manage the development programs in the ORDs they sponsor. Table 1 presents information on characteristics of the individual ORDs (p. D-32).

Failure of most of the ORDs to achieve the pace of development expected has been attributed largely to the absence of a strong policy body at the national level and lack of sufficient coordinating authority in the central office of the Directorate de Développement Rural. The Ministry of Rural Development has recently been reorganized along lines proposed by the IBRD to resolve these problems.

According to the Permanent Secretary of the new Comité de Coordination du Développement Rural, the reorganization will permit the coordination of national, as well as local, levels that was lacking in the past. At the same time, he emphasized that the government remains committed to a highly

decentralized form of development and hopes for a maximum participation by the people in the villages in determining development priorities. He stated that the government is still studying how this can best be done. Meetings were being held with ORD Directors during the week of October 28th for this purpose. An important new element in the system is the establishment of an evaluation and planning unit at Ouagadougou (with UNDP and IBRD assistance) and the intent to have an evaluation unit in each ORD.

While the individual ORDs will have considerable authority in planning and executing development programs, the national government intends to provide policy guidance and supporting services. In particular, the Permanent Secretary noted that Upper Volta must impose some restrictions on rural land use to prevent encroachment of the Sahel and further deterioration of soil resources. The GOUV has asked for assistance of a land use planner for planning the development of virgin resources (e.g., areas cleared of onchocerciasis). UNDP has agreed to assist. This will be followed by efforts to relocate people from the over-populated areas.

The need for adoption of modern production practices in food crop production, as has been done in the case of cash crops such as cotton and peanuts, is recognized by the ministry. The Ministry intends to make better seeds available through the National Seed Multiplication Project being developed with AID assistance and proposes to provide other services required for more modern agriculture, such as plant protection services.

One element of the Ministry of Rural Development's strategy for development, according to the Permanent Secretary, is to encourage commercialization of food crops by providing more attractive prices to producers. The first step has been to establish a grain monopoly, with the ORDs the sole purchasers of cereals and with the National Cereals Office (OFNACER) obliged to buy all the grain from them. The prices at which the ORDs buy from the producers are fixed at CFA 22 per kilogram for the 1974 crop of sorghum/millet and maize. The price at which OFNACER can sell is also fixed by the government, at CFA 37 per kilogram. The difficulties in implementing this marketing program are tremendous - probably beyond the capabilities of any of the ORDs or OFNACER.

Agricultural Extension: Given the autonomy of the individual ORDs (Organisms for Regional Development, the ten regional development units covering the country) in planning and implementing rural development programs, it is understandable that there is not a single, uniform approach to agricultural extension. The staffing and methods of operation have been designed largely by each of the Société d'Intervention engaged in managing the programs. CFDT, which has worked primarily in the cotton-producing areas - Kaya, Dedougou and Bobo-Dioulasso - has organized cotton production and marketing well only where it operates the ORD, but where significant amounts of cotton are growing. CFDT specifies the appropriate seed varieties and cultural practices; procures and distributes seeds, fertilizers, insecticides and spraying equipment; markets and gins the cotton and recovers from the

farmer at the time of sale the advances extended for inputs. Top level positions are usually expatriate, but subordinate staff are locally recruited and trained in government institutions.

The level of staffing has been lower and the effectiveness of organization less in the non-cotton ORDs. The basic pattern of staffing provided as a minimum by the national government is essentially as follows: An ORD is divided geographically into several sectors, each headed by a sector chief. Each sector is further divided into sub-sectors, each with a sub-sector chief who is responsible for directing the Encadreurs (agricultural extension agents). These have been general agricultural extension advisors in the past but in the future three or four encadreurs in the Unités d'Encadrement may be trained in different agricultural specialties. ORD encadreurs are normally recruited from within the ORD from candidates who have a primary education (B.E.P.C. or equivalent). Sector and sub-sector chiefs are normally trained at the national middle school level - Agents Techniques Agricole (ATA). They are recruited from anywhere in Upper Volta. Conducteurs de Travaux Agricoles (CTA) are trained at the associate degree school level. They are employed as sector chiefs or as agricultural extension staff in the ORD headquarters. There are very few persons with university degree level training in agriculture (Ingénieurs de Travaux Agricole or ITA) in Upper Volta and few of them assigned to ORDs; perhaps none below the ORD director level.

Supply of Inputs: Up to now, no infrastructure has existed at the national level for procurement and delivery of agricultural inputs to the farmer. This has been a responsibility of the individual ORDs. CFDT, which has organized cotton marketing in all the cotton growing areas, undertook to import and distribute seeds, fertilizers, pesticides, and spraying equipment for cotton growers. While most of the 4,000 tons of fertilizers used annually in Upper Volta are applied to cotton, CFDT has been making fertilizer available to other users and is in effect the sole importer and distributor of fertilizers. While it may not be the appropriate instrument for providing these services in the future, it appears to be performing these services efficiently. While current fertilizer use on food crops is insignificant, a substantial increase in chemical fertilizers is essential for economical expansion of cereal production. It is particularly important for rice and maize production. Eventually, it seems, it will also be required for sorghum and millet, as fallow periods become shorter.

The Directorate of Agricultural Services, under the reorganized structure of the Ministry of Rural Development, has responsibility for assisting the ORDs in plant protection. It has a small trained staff but little equipment. In November 1974, this Directorate was concerned about the damage being done to the millet crops by a "chinelle" and grasshoppers appearing in many parts of the country. They had neither the equipment nor the insecticides to respond. As they move, and they will eventually have to, to a more intensive agriculture, the problems of disease and insects will be intensified. Ultimately, they will need a national plant protection

system with good communication with the rural areas, in which extension staff are trained to identify conditions indicating disease or insect outbreaks and in which the Directorate and/or the individual ORDs are prepared to mobilize equipment, materials, and personnel to deal effectively and promptly with it.

There is considerable interest in Upper Volta for developing mixed crop and livestock systems, particularly systems using animals for power. IRAT has done some research on animal traction using oxen as well as donkeys for different farming operations. The various ORDs have attempted to introduce animal traction. With the increase in fertilizer prices, there has been renewed interest in these programs from the standpoint of the animal manure provided. One team of oxen could make a significant contribution in organic fertilizers but the economics of animal traction farming rests more on the contribution to better and more timely land preparation and crop cultivation and on the opportunity for a farmer to expand the area cropped with a given amount of labor; for example, with a team of oxen a farm family may easily crop six to eight hectares compared with one and a half to two' hectares with the traditional systems using only human labor. While full use of the animal manure and good crop rotation, including a legume cover crop, such as stylosanthese, which provides excellent livestock forage, will contribute to soil fertility and humus content, commercial fertilizers will also be required for high yields and will be economical, even at current prices, for export crops and certain cereal crops.

Several factors account for the lack of progress in adoption of animal traction. One important factor is certainly a cultural one - the fact that by tradition certain ethnic groups handle cattle and others do not. Perhaps an even more important factor has been the unavailability of capital to make the large investments required for that type of farming.

Agricultural Credit: The lack of credit, in amounts and on terms that will support a transformation from subsistence to viable commercial agriculture, is a major constraint in Upper Volta, as it is in most developing countries. The UNDP project at Matourkou appears to have succeeded quite well in providing the credit needed for an impressive transformation of commercial agriculture. They have undertaken an extension program that now involves 300 farm families in seven villages. The objective of the program is to sedentarize farming and maintain fertility levels to allow permanent farming - continuous cultivation. The program involves introduction of animal traction (oxen) with all essential equipment, improved seed varieties, fertilizers and plant protection. The inputs are provided on credit, and the program is supported by an intensive advisory service. Credit for purchase of the oxen and equipment is provided on the following terms: three years of grace and another five years to repay; interest at five percent. Outside the program, that is through the regular agriculture credit institutions, the terms are 15 percent down payment and three years to repay - terms quite unrealistic for the kinds of investment required for animal traction farming. The Matourkou experiment might be a useful prototype for an improved national credit system. The National Bank for Development has shown interest in the Matourkou experiment and has arranged to send members of its staff to work

in the Matourkou project for in-service training. Afterwards they will be assigned to ORDs as agents of the banks, preparing loan dossiers for submission to ORD Directors.

At the present time, the major source of medium term credit available outside the Matourkou project area is the BND (Banque Nationale du Développement). Through its limited agricultural credit agents, the BND offers credit for 20 percent down, no grace period, and three years repayment. Clearly only wealthy peasants can afford credit at these terms.

Agricultural Research: The French "Institut de Recherches d'Agronomie Tropicale et Cultures Vivrières" (IRAT) is essentially the only institution engaged in research on cereal crops in Upper Volta. IRAT has been operating a research network in the country since 1961. It operates three major stations, two in central region and one in the southwest. IRAT also has several rural stations for localized testing of results. The small station at Mogtedo is used primarily for irrigation research. The stations at Sarya and Faraka-Ba are doing research in varietal improvement on sorghum, millet, corn and cowpeas. Varietal research has followed classical lines. Varietal testing is done using identical fertilizer and cultural practices. Emphasis has been placed on maximum yields under ideal conditions and on development of varieties with short growing cycles. They have made extensive use of plant materials from other West African countries, India and America.

IRAT has also done some useful work on farming systems, placing emphasis on the use of animal and green manures. They have done work on cover crops to be used on fallow lands and recommend use of a legume, Stylosanthes, which is also useful as a forage for livestock. Despite the apparent benefits, this practice has not found favor with Voltaic farmers. It appears to be economically unfeasible because of high labor requirements at times when other activities also require large labor inputs.

IRAT/Upper Volta has linkages with research institutions in Paris; the various French-supported research institutions in West Africa; the various international research institutes, such as ICRISAT, IITA, and IRRI; and with the Institute of Agriculture Research, Samaru, through the AID-supported project on Major Cereals (J.P. 26). It has easy access to plant breeding materials from all of these organizations. This network could be further strengthened by an expanded program of adaptive research that aimed at developing a package of technology suitable and acceptable to Voltaic farmers in different ecological areas. The revised major cereals project (J.P. 26) makes provision for additional field trials officers. One of these will be stationed in either Upper Volta or Niger and work in both countries.

Research on cash crops is undertaken by two other French organizations: L'Institut de Recherches pour les Huiles Oléagineuses (IRHO) for research on peanuts and sesame, and L'Institut de Recherches du Coton de des Textiles Exotiques (IRCT) for cotton research and seed multiplication in collaboration with CFAT.

While IRAT has established a basic research network in Upper Volta, it remains an alien organization, staffed at the professional level almost exclusively with nine expatriate scientists. No important steps have been taken to train Voltaic personnel to take over the operation. The shortage of personnel trained to the level of ingénieur agronome and above is a constraint not only in agricultural research but also for planning and administering agricultural development projects.

D. Economic Analysis

1. Cost Benefit Analysis

Assessing the economic costs and benefits of any intermediate credit operation is complicated by the fact that the ultimate beneficiary is the small farm producer rather than the intermediate institution which receives the capital funds. In the case of this project, the primary beneficiary is neither the Entente Fund, nor in most cases the agricultural development institutions through which the funds will be channeled, but the small farmer who produces food in areas designated for subprojects. Therefore it is impossible to prepare a detailed cost benefit analysis which considers the net benefits accruing to all of these small farm producers as a result of this project. Furthermore, the exact nature of the subprojects which will be financed through this project is as yet undetermined. Therefore an economic analysis of the overall project cannot be performed at this time. However, each subproject will be analysed with respect to its net economic returns prior to approval for funding. The project is expected to promote the use of more productive inputs as well as intermediate technology. Hence the net economic benefit of the project is expected to be positive and to increase with time, since the subproject will be chosen on the basis of their potential spread and replicability effects, and will be somewhat limited in their effects during the initial stages of the project.

2. Macro-Economic Soundness

a. Balance of Payments

At a macro-economic level, the policy goal promoted by this project is a reversal of the declining trend in per capita food production, and ultimately, national self-sufficiency in the production of staple food crops. As evidenced in Section III.A.3 (Food Production Trends, Table B on page 6), the Entente countries have been importing increasing quantities of food, especially staple grains. At the same time domestic food production per capita has declined in all of the Entente countries with the exception of Ivory Coast. At a time when the world price of staple food crops is rising, it appears to be essential for the Entente countries to promote a policy of self-sufficiency or import substitution in the food production sector.

The relative portions of their imports which the Entente countries have been devoting to foodstuffs is as follows:

Niger	10%	(1973)
Upper Volta	16%	(1973)
Benin	16%	(1972)
Ivory Coast	17%	(1973)
Togo	20%	(1972)

Nearly 80% of these food imports are grains and edible oils which could be

grown in the Entente countries. Thus these countries could divert a considerable portion of their foreign exchange resources to productive investments if their food import bill were decreased,

Recent policy statements and development plans in the Entente region indicate that this problem is receiving increasing attention at the highest levels of planning. Ivory Coast has announced that food production will receive more attention during the second fifteen years of independence than during the first fifteen years. The Third Five Year Development Plan of Togo, which is expected to be released in late 1975, considers food production as one of the top priorities in the agricultural sector. Other Entente governments are also devoting increased efforts to food production, especially rice in Dahomey and Niger.

b. Overall Development Policy

The agriculture sector represents by a wide margin the dominant sector in the economies of the Entente states. This dominance holds not only in terms of overall GNP and exports, but also in terms of the number of people who derive their livelihoods directly from this sector. Therefore any sound development policy must be based on a strong agricultural development policy.

As noted in Section II.A., agricultural policy in the Entente region has not been geared towards maintaining price incentives for the producer. Elliot Berg's recent study, "The Recent Economic Evolution of the Sahel", cites disastrous price policies as a major reason underlying the overall economic stagnation of the area. Table 15 cites farmgate prices for major cash and food crops in Upper Volta. These trends are representative of the general thrust of food price trends in the entire region. The upward trend in recent years is unmistakable, and may, if ecological conditions in the region remain normal, bring about a surge in agricultural production.

Agricultural production is fundamental to the economic development of these countries on both the supply and the demand side. On the supply side, it generates revenue for the government, foreign exchange resources, and provides the basis for agricultural processing industries. Equally important on the demand side, agriculture is capable of generating effective demand on the part of the large majority of the population (e.g. the rural population) for a wide variety of goods and services. These goods and services can to a large extent be supplied by the local economy, thereby contributing to the development of basic industry, and local enterprises for both goods and services. A recent dissertation on the Philippines demonstrates that in an area where agricultural productivity and income increased substantially over a decade, fully 80% of the new jobs created in the region were in goods and services for which demand had been generated by the increase in agricultural income. Therefore a dynamic agricultural development policy has the potential of promoting a surge of employment and overall development throughout the entire economy.

TABLE 13: CFFHS 10000

PRICES AND AGRICULTURAL PRODUCTION, 1967-73
(in thousands of metric tons: in CFAF per kg; in CFAF million)

	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74***
Millet:							
Volume	330	314	302	327	298	259	257
Farmgate price*	12	12	12	12	14	16	20
Production value	3,962	3,780	4,344	3,924	4,172	4,144	5,140
Sorghum:							
Volume	546	545	560	506	474	507	493
Farmgate price	13	13	13	14	15	17	23
Production value	7,098	7,124	7,280	7,084	7,110	8,619	11,339
Maize:							
Volume	65	66	69	55	66	59	58
Farmgate price	13	13	13	14	16	19	25
Production value	845	858	897	770	1,056	1,121	1,450
Rice:							
Volume	36	38	39	34	37	34	31
Farmgate price	17	17	18	20	23	28	30
Production value	612	646	702	680	851	952	960
Groundnuts:							
Volume	75	75	78	65	66	60	63
Farmgate price	17	18	18	18	19	21	22
Production value	1,375	1,350	1,404	1,170	1,254	1,260	1,386
Sesame:							
Volume	3	5	8	4	4	6	5
Farmgate price	19	20	20	20	21	22	23
Production value	57	100	160	80	84	132	115
Cotton:							
Volume	17	32	36	24	29	32	27
Farmgate price	29	30	30	30	30	32	35
Production value	493	960	1,080	720	870	1,024	945
Total Agricultural Production Value							
<u>Current prices**</u>	14.3	14.8	15.9	14.4	15.4	17.2	21.1
	(100)	(103)	(111)	(101)	(108)	(120)	(147)
<u>1967 Constant prices**</u>	14.3	15.1	16.2	14.1	13.7	13.5	13.1
	(100)	(106)	(113)	(99)	(96)	(94)	(92)

*Farmgate prices reflect to the extent possible average prices paid to the producer immediately after harvest, and therefore differ from official farmgate prices particularly in the 1971/73 period for millet, sorghum and maize, for which official prices have increasingly tended to lag behind prices actually perceived: Official prices have been used for commodities where price control tends to be more effective, such as cotton, rice (when produced in irrigated areas, about 50 percent of total production) and groundnuts (when sold for processing, about 15 percent of total production).

**CFAF billion.

***Tentative estimates.

Source: Direction du Plan, Haute Volta, as compiled by I.B.R.D., forthcoming Economic Report.

3. Micro-Economic Soundness

At a micro-economic level, the policy soundness of increasing the efficiency of food production is perhaps one of the most effective ways of promoting an increase in small farmers' incomes, which in turn will contribute to the development strategy outlined above.

For a subsistence farmer, as nearly all farmers in the Entente countries are, food production represents the first priority, the sine qua non without which the farm family cannot survive. This priority was made abundantly clear during the drought years when farmers attempted to assure first their supply of food, and were only secondarily interested in cash crop cultivation.

Despite this primary concern of farmers with food production, the agricultural development policies of the Entente governments have paid very little attention to food production. All major development efforts have been oriented towards cash crops, and have ignored food production even to the extent that it is complementary to cash crop production. But what these policies failed to take into account is that the biggest single constraint on the expansion of cash crop production was the inefficient methods of food crop production. The subsistence farmer must assure the food supply of his family: if his production techniques are inefficient, he and his family will allocate much time to food production, and have that much less time to devote to cash crop cultivation, where labor is also the greatest single constraint.

To the extent that this project increases the efficiency and productivity of small farmer food production, the income of the small farmer will increase, because he can assure his subsistence food supply, and then devote time to the cultivation of surplus food crops or cash crops, whichever the price mechanism renders more profitable. Thus the small farmer should increase his income as a result of this project, even if domestic food surpluses fail to increase owing to unfavorable price policies.

The economic soundness of the project at the level of the small farmer will be assured by the preparation of a farm budget which will confirm that the technology proposed by the subproject is profitable to the farmer.

E. Financial Analysis

1. The Entente Fund

a) Sources of Funds

The operations of the Entente Fund are funded predominantly from two source categories: (1) capital contributions from member states and (2) loans and grants from foreign donors.

Since the establishment of the Entente Fund Secretariat in 1966, the member governments have made annual contributions for the constitution of a capital guaranty fund. The annual contributions are as follows:

Ivory Coast	FCFA	500,000,000	(77.0%)
Upper Volta		42,000,000	(6.5%)
Niger		42,000,000	(6.5%)
Benin		42,000,000	(6.5%)
Togo		24,000,000	(3.5%)
Total		<hr/> 650,000,000	<hr/> (100.0%)

Capital contributions from member states total 650 million FCA annually. At the end of 1974, these contributions amounted to about \$25 million. This capital is held in reserve as security for the guaranties granted by the Fund, and is retained in two Paris banks. According to the Fund's statutes, potential guaranties are limited to ten times the capital. This capital may not be used for other purposes. Interest received on these capital deposits as well as commissions for guaranties finance the operating budget of the Entente Fund.

Other donor assistance is extended to the Entente Fund for specific project activities to be carried in the Entente countries. Development Loans and grants have been accorded the Entente Fund by the French Aid and Cooperation Fund (FAC), Canada, European Development Fund (FED) and AID. FAC assistance has been in the form of grants. AID represents the major source of foreign donor assistance. AID has provided \$25 million in four prior loans and is presently considering capital projects amounting to \$22.5 million. In addition, AID has provided several grant contributions for technical assistance. Other assistance from the French and Canadian governments is made on direct country to country basis, although some of this activity may be managed by the Entente Fund. Table F lists all donor developments activities financed through the Entente Fund since 1971.

b) Uses of Funds

At the present time, the guaranty Fund of the Entente Fund has guaranteed 19 projects, including several for Entente housing in member states, an Entente livestock building in Ouagadougou, a villa in Benin, a hotel in Niger, several warehouses, sanitation facilities in Lome, agricultural equipment and four factories in Niger and Upper Volta. These guarantees have been accorded directly to beneficiaries such as Entente governments, Chambers of Commerce, and state-owned enterprises (see Appendix III).

These outstanding guarantees amount to about \$7.7 million, despite the Fund's authorized capacity to guarantee up to ten times its capital, or \$250 million. Thus the Entente Fund has a large guaranty capacity (over \$242 million) which could be used to encourage investments in the Entente region. A joint study by the Entente Fund and AID under the auspices of the African Enterprise project may encourage the use of this untapped resources in relation to African enterprises.

The operating and development budgets of the Entente Fund are financed by the return on the investment of the guaranty funds managed by the Entente Fund. This budget totalled FCFA 578.5 million or \$2.6 million in 1974 and 855.4 million FCFA (\$3.9 m) in 1975 (see Table 16). In 1974, F CFA 66.6 million, or 11.5% of the operating budget, were devoted to development interventions. Of this amount, CFA 30.2 million were allocated to tourism projects; CFA 16.3 to the Fifteenth Anniversary of the Fund (each Member State receiving a sum to use as it wished); CFA 14.2 million to livestock and African enterprise programs; and the balance to miscellaneous development activities.

Of the 1975 budget, about 30% was utilized by the Entente Council largely for programs to strengthen the unity of the Member States as a group and, thus, was not available for the activities of the Fund itself. Of the remaining F CFA 593.9 million, CFA 107.5 million went for amortization of buildings of the Fund and operating costs; CFA 61.3 million was earmarked for commitment, largely for hotel and health clinic construction; and CFA 275.0 million (32.1%) went directly into the development activities shown in Table 17. A balance of CFA 150.0 million was carried over into the 1976 budget in order to compensate for the anticipated reduction in revenues. Included in the operating budget for this year were the costs of regional meetings and conferences dealing with development programs and regional travel and other local costs of the Fund's technical advisors.

TABLE 16

ENTENTE FUND
INCOME AND EXPENSE ANALYSIS
(IN THOUSANDS OF CFA)

	<u>1973 (Actual)</u>	<u>1974 (Actual)</u>	<u>1975 (Actual)</u>
<u>Receipts</u>			
Funds on hand beginning of year	18,426	83,926	225,341
Interest on capital deposits	317,526	472,927	600,556
Guaranty commissions	1,657	2,350	2,619
Miscellaneous	14,627	19,312	28,849
Drought relief	30,000	-	-
Total	<u>382,236</u>	<u>578,515</u>	<u>855,365</u>
<u>Expenditures</u>			
Operation of the secretariat	55,800	126,683	189,664
Financing charges	120,000	51,764	167,876
Constructions	15,000	21,775	144,556
Grants	41,000	42,965	48,343
Development interventions	19,000	66,617	82,286
Interest	-	-	-
Reserves and miscellaneous	17,510	32,370	72,040
Drought relief	30,000	10,000	-
Total	<u>298,310</u>	<u>352,174</u>	<u>705,365</u>
Balance of funds remaining at end of year	<u>83,926</u>	<u>225,341</u>	<u>150,000</u>

TABLE 17

ENTENTE FUND DEVELOPMENT INTERVENTIONS - 1975

<u>Activity (1975)</u>	<u>Amount (in million FCFA)</u>
Tourist Hotels and Study	106.8
Health Clinics Construction	27.7
African Enterprises	30.0
Livestock Programs	74.8
Agriculture Programs	15.3
Telecommunications	<u>20.4</u>
Total	275.0

In 1974 and 1975, the Fund benefited from an unusually high return on its invested capital which enabled it to increase substantially its activities. With sharply reduced interest rates, however, and despite increases in the size of its capital, the Fund's income in 1976 and the carryover from 1975 will provide for a reduced budget level of an estimated F CFA 706 million.

c) Overall Financial Capacity

Owing to the underutilization of its resources, both budgetary and capital (for guaranty funds), the Entente Fund is perhaps the most financially sound organization in francophone Africa. With an annual contribution from member states of \$3 million, total assets of \$30 million, and conservative development and guaranty policies, the Fund undergoes minimal risk. Its operating budget of 578.5 million FCFA (\$2.8 million) in 1974 covered all operating expenses while sustaining a surplus of over a million dollars. This surplus is expected to be carried over to the 1975 operating budget. The operating budget grows proportionately with annual increases in capital contributions, which are guaranteed by member states for at least three more years, and will probably be renewed. Thus it is difficult to imagine financial problems other than excessive liquidity in the near future.

2. The Entente Member States

A financial assessment of the Entente States is included in the CWR Development Assistance Program for FY 1975. The terms of overall budgetary and balance of payments trends, the countries appear to have sustained an equilibrium position despite the economic upheavals precipitated by the Sahel drought and world-wide inflation. Table 18 indicates some financial features of the Entente States.

It is clear from Table 18 that the inland countries have comfortable reserve positions, manageable debt burdens vis-a-vis these reserve positions, and sufficient government revenue to cover operating expenditures, with a small surplus for development. The only possible cause for concern is Upper Volta's weak trade balance. On balance, however, it appears that both Upper Volta and Niger could use more of their surplus reserves for development purposes.

Financially, the coastal countries maintain less comfortable positions. Ivory Coast has been threatened by an excessive debt servicing burden vis-a-vis its reserve position, but has managed to increase exports sufficiently during the last two years to reduce its debt service ratio. Rather than accumulating reserves, it appears that Ivory Coast spends its resources on development, as witnessed by the large surplus of government revenue. Dahomey and Togo appear to be in the most precarious financial situation with smaller reserves, small government surpluses for development and continuing trade deficits.

In light of the above, it appears that all countries should be capable of supporting 20% of subproject costs.

3. Prospects for Repayment

a) Financial Capacity

The prospects for the repayment of the loan appear to be excellent. Although it is impossible to determine the financial rates of return for subprojects at this time, a financial assessment will be made of each subproject. (See Subproject Analysis Framework in Section V.A.). Clearly there will be an element of risk in subprojects oriented towards small farmer food production. However, the financial capacities of the Entente governments, with one or two possible exceptions, appear to be capable of handling this in the short-run; and development prospects in the longrun are favorable, and will improve further if these countries grasp the importance of small farmer production.

The loan is jointly and severally guaranteed by the Entente States. The Entente Fund is fully capable of sustaining its obligation to repay the loan, and could conceivably be requested to repay portions of the loan at some later date by its member states.

b) Maintenance of Value Provision

The Entente Fund will repay the loan portion of the project in U.S. dollars. The member governments will repay the Entente Fund in CFA Francs. However, the Entente Fund passes on the burden of maintaining the value of the repayments to the member governments by requiring that all payments in CFA francs be made in the dollar equivalent as calculated at the time the payment is requested. Thus the Entente Fund is fully protected as regards the maintenance of the value of the loan.

TABLE 18

FINANCIAL INDICATORS

<u>Country</u>	<u>Reserve Holdings</u>		<u>Debt Service</u> <u>as % exports</u> <u>1972</u>	<u>Government Revenue</u> <u>as % current ex-</u> <u>penditures</u>	<u>Trade Surplus</u>	
	<u>June/July</u> <u>1974</u> <u>(million \$)</u>	<u>as %</u> <u>imports cif</u> <u>1973</u>			<u>Exports</u>	<u>Imports</u>
Upper Volta	63.0	91%	10.4%	118% ^{2/}	38% ^{2/}	
Niger	35.0	54%	4.3%	130%	82%	
Ivory Coast	66.0	10%	10.4%	161%	113%	
Benin	21.0	20%	6.1%	105% ^{1/}	79% ^{1/}	
Togo	39.0	41%	9.6%	107%	90% ^{1/}	

Source: Data supplied by AFR/DP, World Bank and IMF studies.

^{1/} 1971 figure -latest available

^{2/} 1972 figure -latest available.

PART V. IMPLEMENTATION PLAN

A. ADMINISTRATIVE ARRANGEMENTS

1. The Entente Fund

The Entente Fund operates under a Secretariat headed by an experienced African Administrative Secretary. Under the direction of the Administrative Secretary is a small, but technically competent staff of four provided by FAC and AID. The Entente Fund appears to be fully qualified professionally and by statute to assure effective implementation of the project, and has the personnel, experience and financial capacity to handle capably the programming and financial aspects of this loan. The Fund has demonstrated this capacity in the implementation of several AID loans in the Entente countries. For a full description of the administrative structure of the Entente Fund, see Section IV.C.

Within the Entente Fund, the main responsibility for the Food Production project is delegated to a project management team specifically recruited for the project. This team will consist of three professionals representing experience in agricultural economics, rural development and the agronomics of crop production. The team will be complemented by other AID contractors to the Entente Fund. The Entente Cereal project team residing in Niamey consists of a training officer, an engineer, and a grain storage expert. The Entente African Enterprise project manager is a financial expert and will assist with the credit component of subprojects, since he is familiar with local development banks.

The technical assistance funds provided for the project will support rural development seminars, management training and other technical inputs as necessary for the implementation of the project. The administrative capability of the Entente Fund to provide these essential inputs on a timely basis has been demonstrated in other AID projects.

2. Entente Governments

The responsibility for coordinating and administering subprojects at the host country level will rest within the respective Ministries of Agriculture or Rural Development in each country. These ministries will coordinate the various components of subprojects among national extension services, agricultural credit institutions, marketing institutions, and agricultural and sociological research institutions.

The capacities of these ministries and their complementary institutions to administer the project varies. In general, the role of these institutions in food crops has been limited, owing to the relatively low priority food crops have enjoyed in comparison to export crops. Furthermore, much of the extension and credit services available in the Entente countries have been channeled through semi-autonomous societies

charged with the production and marketing of a single crop. Therefore, these national institutions have had little experience in administering small farmer oriented food production projects.

The administrative infrastructure in Ivory Coast is relatively more developed than in the other countries, although the role of foreign advisors is substantial, occasionally impeding the development of Ivorian skills in this area. In Upper Volta, the ORDs (Organismes Regionaux de Developpement), established in 1965 to plan and implement development projects in their respective regions, have begun to acquire experience and expertise in administering the types of rural development projects envisaged under this loan/grant. In Niger, the Directorate of General Agriculture is relatively understaffed, with each extension worker or moniteur serving about 4,000 farmers. Togo and Benin are developing regional development organizations similar to the ORDs in Upper Volta, but these organizations appear to be functioning in limited areas.

These rural development organizations clearly have limited capacities to perform their nation-wide tasks. They will benefit from participant training and training seminars as well as on-the-job training through the technical assistance component of this project, and through the project will gain greater capacity to deal with sector and policy issues concerning small farmer food production.

B. IMPLEMENTATION PLAN

1. Responsibility and Mechanism for Implementation

a. The Entente Fund

The Entente Fund, as the Borrower/Administering Agency, will bear the primary responsibility for the overall implementation of the program. Through the Fund, it will be possible to establish common standards and criteria for subprojects, to coordinate the subproject activities of five countries, to coordinate national and international programs of research concerning aspects of rural development and food production, to organize seminars and other meetings to discuss the results of subproject evaluations and to exchange other information, and to fulfill the technical assistance and planning requirements necessary for the success of the program. The necessary planning and coordination will be assured through national and regional meetings held at periodic intervals with all the interested parties, including the agricultural development banks, responsible government officials, and other donors, as appropriate, and by frequent visits by the project management team and Fund personnel to the cooperating countries and institutions.

Specific functions of the Entente Fund will include (a) allocation of the AID loan and grant capital resources to the cooperating countries based on requirements for funding and on programs to be submitted

by each country; (b) regional coordination of subproject design, management and evaluation with national institutions; (c) coordination and provision of support services for subprojects when not available from national sources; (d) organization of U.S. participant training programs and other short-term training courses and seminars for agricultural and rural development personnel of the Member States in order to develop the national capabilities to identify, design, implement, and evaluate small farmer rural development and food production projects; (e) arranging for the provision of specialized technical assistance in specific fields to national ministries or implementing agencies when necessary to complement the expertise of their personnel; (f) organization of national and, as necessary, regional meetings at the operational and/or policy-making level with Entente Member State ministries and agencies and various research institutions regarding food production matters including ways of increasing food production capacities of small farmers; (g) supervision of the implementation of the sector assessment; (h) provision to AID of all information and documentation as may be required to review and approve subprojects; (i) submission to AID for its approval copies of long-term contracts it intends to execute with technical assistance personnel; (j) submission to AID for its review signed copies of all Sub-Project Agreements executed with Member States; and (k) submission of semi-annual reports on the status of subprojects, disbursement of funds, and technical assistance and planning and coordination activities.

The Entente Fund will obtain the guarantees of the participating governments, sign Subproject Agreements with the participating countries (subject to AID approval), and make all disbursements to participating implementing agencies in accordance with the guidelines established in Part III, Section D, and contained in the Loan Agreement and Subproject Agreements.

The Entente Fund is also responsible for the implementation of the substantial technical assistance component of the loan, and for all contracting essential to the implementation of the project. However, contracts funded by AID will require individual AID approval through REDSO/WA.

The Entente Fund will submit a semi-annual report on the status of the subprojects, the disbursement of funds, and activities undertaken under the technical assistance component of the project. The Fund is also responsible for evaluations of specific subprojects. Further evaluation measures will be the joint responsibility of AID and the Entente Fund (see Evaluation Plan, Section V.C., below).

b) Entente member governments

a) Sub-project implementation. Each Entente member government is responsible for identification, design and implementation of AID/Entente sub-projects in its national territory. It may request assistance from the EF as necessary to ensure rapid and efficient project identification, design, revision and implementation.

b) Training. Governments will assist the Entente Fund in the selection of candidates for training under the AID/Entente program, will pay their salaries during the training period and will place the trained national in a position where he can fully utilize his training experience.

c) Loan Guarantee. Repayment of the loan to the EF will be jointly and separately guaranteed by the Member States.

d) Sector Policy. Each member state will, of course, be responsible for participating in regional discussions of food production research, sub-project evaluation and sector policy and for determining how national agricultural policy should be adapted to place increased emphasis on small farmer food production.

c) AID

The responsibilities of AID in the implementation of this project include:

1) Review and approval of all sub-projects in accordance with the procedures in Section III.F.2.;

2) Review and approval of all long-term contracts financed by the technical assistance grant;

3) Review of semi-annual reports from the Entente Fund;

4) Arrangements for special annual evaluations with the Entente Fund and one annual meeting between AID and the Entente Fund to review the evaluation results. Such evaluation will seek to review the technical and administrative arrangements for the project, the subproject criteria, the adequacy of final subproject design, the status of subprojects which are being implemented, and any other points which may require adjustment to facilitate the implementation of the project while preserving its purpose and goal. AID may propose such steps as necessary to improve mechanisms to insure future application of the subproject criteria and adequacy of final design, and other matters, as may be necessary for the effective implementation of the project. Additional funding tranches under the project will proceed only after such evaluations.

2. Subproject Agreements Between the Entente Fund and the Member States

Subsequent to execution of the loan/grant agreements, the Entente Fund will prepare a letter addressed to the Ministers of Agriculture and/or Rural Development of the five Member States which will detail the criteria which will be used in determining subproject eligibility and the analyses which must be carried out while developing a subproject proposal. The Entente Fund will submit a specimen of this letter to AID for its review and comments.

In order to ensure a wider understanding of subproject eligibility criteria and the procedures to be followed in developing proposals, the Entente Fund will also meet with personnel of the Ministries of Agriculture and/or Rural Development to discuss those criteria and procedures.

The Entente Fund will prepare and submit to AID for its review and approval a specimen of the Subproject Agreement it intends to execute with the Member States in order to obligate funds for subprojects. Although there should be a basic form for the Subproject Agreements, it is understood that their exact content may vary according to the nature of the subprojects authorized for funding. Therefore, in addition to approving the standard form, AID reserves the right to review each Subproject Agreement or Amendment thereto following its execution.

3. Subproject Submission and Approval

The development of subprojects will require close collaboration between the Entente Fund's Project Management Team and Member State Officials.

Before the Entente Fund obligates funds to finance a subproject, the Fund and the Member State officials must be satisfied that all necessary plans and analyses are complete and that the subproject is technically and socially sound, financially and economically feasible, and consonant with the objectives of this project as outlined in Sections III.D. and IV.A.1. The Entente Fund's obligation of funds for a subproject will be based on and subsequent to its approval of a project proposal prepared in accordance with the Subproject Analysis Framework outlined in Section IV.A.2. and formally submitted to it by the government of the Member State.

AID will approve subprojects through REDSO/WA on the basis of REDSO/WA's assessment and comments from the Country Development Officer in Upper Volta and the Regional Development Officer in Niamey, who is responsible for AID programs in Togo, Benin, and the Ivory Coast as well as in Niger.

AID will review all subprojects and approve them on the basis of a positive determination that: a) the subproject eligibility criteria set forth in Section III.D. have been met; and b) the project neither duplicates nor conflicts with other AID or other donor activities in the country.

AID will carry out this review and approval process as early in the subproject identification and design stages as possible, in order to avoid substantial design efforts on subprojects which do not fully meet the basic project criteria. Nonetheless, AID may reserve judgment on some component of the subproject until the final design has been completed if there exists a possibility that subproject eligibility might be compromised during the design process.

In addition to this process of AID review and approval which will apply to all subprojects, for those subprojects involving more than \$1,000,000 in AID funds, REDSO/WA will review the Member State's final proposal in terms of its economic, financial, technical, and social feasibility and give its approval before the Entente Fund obligates funds for it.

4. Technical Assistance

Various levels of technical assistance have been identified as essential to the success of this program. These levels are discussed in Section III.C.2. The Entente Fund will coordinate technical assistance within and among the participating countries, keeping in mind both the short-term objectives of subproject design and implementation, and the long-term objective of developing the capacity of the Entente governments to identify, design, implement and evaluate small former-oriented rural development projects.

5. Implementation Schedule

Approval of entire proposed loan/grant project and authorization of initial \$8,000,000 tranche of loan funds	15 April 1976
Grant agreement obligating initial tranche of \$790,000 for TA and loan agreement executed by AID and EF	30 June 1976
Loan agreement ratified by Member States	30 September 1976
Grant agreement obligating initial tranche of \$3,000,000 in grant capital assistance funds executed by AID and EF	31 October 1976
Project management team on board	1 November 1976
First Letter of Commitment for TA opened	15 November 1976
Approval of C.P.'s to disbursement of loan	31 December 1976
First subproject agreement signed with Member State	1 March 1977
First Letter of Credit for subproject opened	15 May 1977
Remaining TA and grant capital assistance funds obligated	31 October 1977
Remaining loan funds authorized	31 March 1978
TDD for loan funds	30 September 1981

C. EVALUATION PLAN

Evaluations of the project will occur at two levels: first, each subproject will be evaluated on the basis of a base-line survey carried out prior to subproject implementation. These evaluations will be coordinated by the Entente Fund and will benefit from the participation of host country sociological research institutions and outside contractors, as needed. These periodic evaluations will cover as a minimum the items cited in Table E, Section IV.A.2., on page 56 of the project paper. In addition to these items, the evaluation will assess the general acceptability of the subproject in terms of: 1) number of participating farmers; 2) increases in crop yield; 3) increases in income; and 4) other relevant factors.

Evaluations will also be conducted at the level of the entire project. The semi-annual Entente Fund reports and annual meetings between AID and the Fund will provide a framework for regular discussions between AID and the Entente Fund. (See Section V.B.4. on page 95) In addition, AID may conduct an evaluation of the project periodically as necessary. An appropriate time for such an evaluation might be prior to the authorization of the second tranche of the project in conjunction with or prior to the joint AID-Entente evaluation, and again prior to the preparation of any follow-on project.

D. DISBURSEMENT PROCEDURES

1. Local Cost Expenditures

The Entente Fund will make disbursements for the local currency cost portion of all eligible subprojects and for the local currency cost of technical assistance. These disbursements will be made against an advance provided by AID through REDSO/WA when conditions precedent have been met.

Reimbursement by AID to the Entente Fund will be in accordance with usual AID procedures, upon presentation of documents specified by REDSO/WA. Such requirements will be the subject of an Implementation Letter.

2. Dollar Expenditures

Upon request by the Borrower, AID will issue appropriate commitment documents in order to finance the eligible dollar cost of the project. The Borrower may at his option make direct reimbursement from his own resources for eligible items under the project and seek reimbursement from AID by presentation of the usual documentation. Procurement of AID-funded goods and services will meet AID's then-current Capital Project Guideline requirements.

CONDITIONS PRECEDENT TO DISBURSEMENT

The usual legal opinions and documentation establishing the validity of the obligations of the Borrower (the Entente Fund) and guarantors (the member governments) will be required.

As a special condition precedent to disbursement of loan funds and capital grant funds, the Entente Fund will submit a specimen Subproject Agreement to AID for approval. The Entente Fund will also submit a specimen letter or protocol outlining the criteria to be considered by the governments in developing applications for subprojects, and defining eligible subprojects which can be financed under the present project. AID reserves the right to review each subsequent Subproject Agreement to assure the preservation of the objectives of the original AID authorization.

F. COVENANTS

The covenants of other AID loans to the Entente Fund with respect to use of funds will be made applicable to this new loan. These covenants include:

1. Subprojects. The Borrower will use the proceeds of this loan and grant to make subloans and subgrants to each of the Entente Member States for the purposes described in Annex I, "Project Description," attached hereto, and in accordance with the procedures which are established in this Agreement and further described in Implementation Letters. The Borrower will also submit to AID for its approval a specimen of the Subproject Agreement which it intends to execute with the Member States, as well as copies of all such agreements or amendments thereto which are executed.

2. Special Accounts. Until the loan is repaid, the Borrower agrees that all funds received from the Member States in repayment of the obligations incurred under the Subloan Agreements, and the income accruing from such funds, will be deposited in one or more special accounts. The Borrower agrees to use the funds in the special accounts and the income derived therefrom only for debt servicing of this loan and for other activities in support of the general purposes of this project to encourage small farmer food production in the Member States.

3. Additional Resources. The Borrower agrees to provide such additional resources to the member countries and the sub-borrowers in the nature of technical assistance, policy guidelines, coordination of activities, and facts and statistics as is required to advance the project and as is consistent with resources available to the Borrower. The Borrower will exercise its best efforts to assure that the Entente governments accept such resources and apply them diligently for purposes of the project.

4. Validity of Agreements. The Borrower and each of the Guarantors represent that the making and performance of this Loan Agreement have been duly authorized by all necessary governmental approval and do not contravene any law, regulation or contractual restrictions.

Organization, Authority and Operations. The Borrower and each of the Guarantors will attest to the validity of the organization, authority and operations of the Borrower, and its administrative, technical, financial and legal ability to carry out the purpose of the Loan.

G. JUSTIFICATION OF WAIVERS FOR PROCUREMENT

1. Discussion

Section 636(i) of the Foreign Assistance Act of 1961, as amended, prohibits AID from the purchase or long-term lease of motor vehicles unless such vehicles are manufactured in the United States. Section 636(i) does, however, provide that "...where special circumstances exist, the President is authorized to waive the provisions of this section in order to carry out the purposes of this Act."

The Executive Committee for Project Review holds the opinion that one of the objectives of this loan/grant project, which can be defined as the promotion of a strategy of small farmer food production, including input delivery and marketing, reflects special circumstances that justify the waiving of the above requirements of Section 636(i) and the source/origin requirements generally set forth in Chapter 2 of A.I.D. Handbook 15.

a. Code 935 Procurement for Vehicles

The Sahel drought emergency of 1974 demonstrated not only the importance of the transport and marketing sector in the Entente area, but also the predominance of large, foreign-dominated near-monopoly enterprises which control this sector. Attempts by AID to identify locally owned and operated enterprises through which to distribute emergency food shipments revealed the paucity of such enterprises, although small and medium trucking enterprises were mobilized under sub-contracts and informal arrangements to haul foodstuffs between distribution points to the extent possible.

While the worst of the drought is presently considered to be over, the continuing effort in economic development, particularly in the area of agricultural marketing and production, and the immense logistic requirements in moving agricultural inputs to farmers and in turn

produce to markets, depends on the availability and prices demanded by private transporters. Agricultural producers and consumers will benefit to the extent that the marketing and input delivery mechanisms are improved through expanded transport service facilities, and to the extent that competition reduces the costs of transport and the accompanying monopoly power of expatriate transport enterprises.

The chief rationale for permitting the purchase of non-U.S. vehicles is the lack of availability for servicing and spare parts for U.S. vehicles in the region. AID's own experience with U.S. vehicles in the Sahel and coastal countries demonstrates that these vehicles are of utility strictly under urban driving conditions, and even then, spare parts availabilities are at an absolute minimum. The availability of the necessary maintenance and servicing facilities is of extreme importance in these countries, owing to the difficult driving conditions resulting from rough, rain-gutted roads which cause frequent breakdowns.

In addition to the "special circumstances" requirements of FAA Section 636(i), AID Handbook 15 establishes as a criterion for the waiver of AID's source requirements the nonavailability of an essential commodity from eligible sources. The Memorandum of Conversation regarding U.S. dealerships in vehicles in the Entente regions, attached as ANNEX I, confirms that U.S. manufacturers have indicated that they do not have outlets for U.S. vehicle dealerships and servicing in the Entente region, nor do they intend to establish such outlets in the foreseeable future.

The Executive Committee for Project Review feels that it is essential for Africans in the agricultural sector to be provided the most efficient, reliable and serviceable means of transportation if they are to fulfill their role of alleviating and bottlenecks in economic development stemming from the limited coverage of transportation facilities. It appears to be clear that procurement of U.S. vehicles would not be in the best interest of the development of the transportation sector in terms of economic efficiency, spare parts availability and serviceability required by the African small farmers' cooperatives.

b. Code 935 Procurement for Technical Services

The case for Code 935 procurement of short-term or long-term technical services for subproject design, implementation, or evaluation rests essentially on the difficulty encountered in identifying qualified, French-speaking technicians from Code 941 sources in general and particularly from the U.S. For this reason, the Entente Fund has requested that provisions be made for contracting Code 935 experts as needed. REDSO/WA would determine the need and grant waivers on a case-by-case basis when the Entente Fund can demonstrate that its own contribution to the project cannot finance the necessary Code 935 procurement and when it has already made an intensive search for three months for a qualified, French-speaking technician from the U.S. or other Code 941 source without being able to identify one.

2. Recommendation

On the basis of the discussion above and the Memorandum of Conversation contained in ANNEX I concerning the nonavailability of U.S. vehicle dealerships and servicing in the Entente region, the Project Committee recommends that the Administrator determine: a) that special circumstances exist in this case which justify the procurement of non-U.S. vehicle and technicians for the purposes of subproject design, implementation, and/or evaluation; and b) that the exclusion of Code 935 procurement would seriously impede attainment of U.S. foreign policy objectives and the objectives of the Foreign Assistance Act as regards the present loan and grant project.

Pursuant to this determination, the Project Committee recommends that the Administrator approve a waiver to permit such Code 935 procurement in an amount not to exceed 5% of total loan and grant funds, up to two-third of which may be used for vehicle procurement and up to one-third of which for procurement of experts, on a case-by-case waiver basis.

The Technical Assistance Grant and the Capital Grant include provisions for local currency financing and for Code 941 procurement, as stated in Section III.D.6 of the Project Paper. The Executive Committee for Project Review holds the opinion that both local cost financing and U.S. Code 941 procurement are essential for the utilization of these funds in accordance with the purposes of the Foreign Assistance Act, as reflected by the present project. Experience in the Sahel countries has demonstrated that U.S. procurement is of limited availability, and cannot respond to the full spectrum of development needs faced by those countries. The Entente countries as a group face the same development problems as the Sahel countries. Four of these countries are among the twenty-five least developed countries as identified by the United Nations. Another four of the Entente countries are cited as those countries which are most seriously affected by the dramatic rise of oil and those products derived from oil. It is the opinion of the Executive Committee for Project Review, that the tying of grant funds to U.S. procurement would render impossible the attainment of the purposes of the project. Therefore, the Committee requests that a waiver be granted to untie the grant funds in the project from U.S. procurement, and make them eligible for local currency financing and U.S. Code 941 procurement. The Committee recommends that 85% of capital Grant funds be untied in this manner, and that technical assistance grant funds be untied for local currency financing and Code 941 procurement.

H. NEGOTIATING STATUS

No special problems in the negotiation of the Loan and Grant Agreement and/or reaching agreement on the implementation plan are foreseen.

I. Issues

None.

CONSEIL DE L'ENTENTE

FONDS D'ENTRAIDE ET DE GARANTIE
BOITE POSTALE 2886-ABIDJAN
TELEPHONE 28-28-28

SECRETARIE ADMINISTRATIF

ANNEX A

page 1 of 5 pages

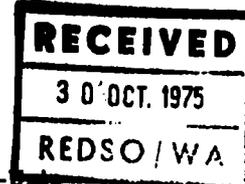
ABIDJAN, LE 24 OCT. 1975

N° 1247 S. A.

Le Secrétaire Administratif

OBJET: Requête pour
la production vivrière.

à Monsieur le Directeur
de REDSO
Ambassade des Etats-



ABIDJAN

Monsieur le Directeur,

Suite à nos échanges de correspondances en 1974 qui ont permis d'organiser au mois de Novembre dernier une réunion des responsables de la production vivrière, vos experts ont pu se convaincre sur place de la nécessité d'apporter une aide pour le développement des productions vivrières -

Les projets identifiés par la Mission USAID justifient dans un premier temps un financement de quinze millions de dollars dont dix millions sous forme de prêt réservé aux pays côtiers et cinq millions à titre de subvention pour les pays les plus défavorisés -

Il doit être prévu en outre des crédits d'assistance technique en particulier pour mettre à la disposition du Fonds et des Etats les experts nécessaires à la mise en oeuvre de ces financements

Je vous serais reconnaissant des dispositions que vous pourrez faire prendre pour que les opérations puissent effectivement démarrer à l'occasion de la prochaine campagne agricole - (avril 1976).

Vous remerciant de votre inlassable collaboration et comptant sur votre appui auprès des instances de l'AID, je vous prie d'agréer, Monsieur le Directeur, l'assurance de ma considération distinguée.



Paul KAYA.

TRANSLATION

Letter from Paul Kaya, Administrative Secretary, Entente Fund.
to REDSO/WA Director.

Subject: Request for Assistance,
in Food Production

October 24, 1975

Dear Sir:

Referring to our exchange of correspondence in 1974, which led to a meeting of the persons responsible for food production last November, your experts became convinced of the necessity to provide assistance for the development of food production in the Entente states.

The projects identified by the AID Mission justify as a first step a financing of fifteen million dollars, of which ten million in the form of a loan for the coastal countries and five million under a grant for the disadvantaged interior countries.

Furthermore, technical assistance credits have been planned particularly with a view of making available to the Fund and the member states the experts necessary for the implementation of this activity.

I would appreciate it very much if you could have the appropriate measures taken so that the operation may effectively start during the next agricultural season beginning in April 1976.

Thanking you for your untiring collaboration and relying upon your making earnest representations to AID, I send you the assurance of my distinguished considerations,

Paul KAYA
Administrative Secretary
The Entente Fund

**MINISTÈRE
DES AFFAIRES ÉTRANGÈRES
ET DE LA COOPÉRATION**

RÉPUBLIQUE DU DAHOMEY
FRATERNITÉ - JUSTICE - TRAVAIL

AID
Rec'd 8/13/75

DIRECTION DU DÉPARTEMENT 2
(EUROPE OCCIDENTALE
ET AMÉRIQUE DU NORD)

N° 1954/MAEC/D2/O.-

Le Ministère des Affaires Etrangères et de la Coopération de la République du Dahomey présente ses compliments à l'Ambassade des Etats Unis d'Amérique et, se référant à sa note n° 1954/MAEC/D2/D du 21 Mai 1975, a l'honneur de lui faire tenir ci-joint, pour transmission aux Autorités de l'USAID à ABIDJAN, en vue de son financement, six (6) exemplaires du projet "Développement de la Culture du Riz au Dahomey".

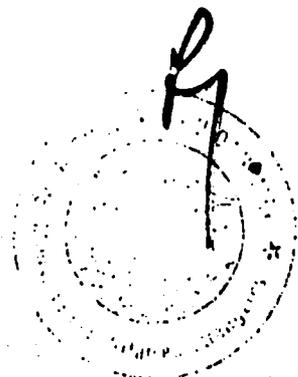
Le Ministère des Affaires Etrangères et de la Coopération de la République du Dahomey remercie l'Ambassade des Etats-Unis d'Amérique de son obligeante entremise et saisit cette occasion pour lui renouveler les assurances de sa haute considération./-

.J. : 6 Dossiers.-

COTONOU, le

AMBASSADE DES ETATS-UNIS D'AMERIQUE

- COTONOU -



DIRECTION GENERALE
DU DEVELOPPEMENT AGRICOLE

No 2291 /AGRI/DGDA

Abidjan, le 20 OCT. 1975

Objet :

Le Ministre de l'Agriculture,

à Monsieur le Secrétaire Administratif
du Conseil de L'Entente

à ABIDJAN

N°	4306
Date	21-10-75
DEST	VISA
PCR. ADM	
RE. ICR	
X LI. AND	
MINGES	M
REVEL	

Monsieur le Secrétaire Administratif,

Faisant suite à votre lettre n° 1 057/S.A. du 5 Août 1975, j'ai l'honneur de vous adresser ci-joint en cinq exemplaires la requête du Gouvernement ivoirien à l'US-AID.

Cette requête est relative au financement d'une partie d'un projet général de multiplication de semences sélectionnées.

Elle comprend trois sous-projets qui sont, par ordre de priorité :

- Projet : formation des cadres nécessaires à la réalisation de l'opération,
- Projet : Création d'une infrastructure de stockage des semences sélectionnées sur le réseau d'essais multilocaux et de multiplication,
- Projet : Financement du premier stade des multiplications de semences sélectionnées pendant le temps nécessaire à la mise en route de l'ensemble du réseau de multiplication, l'opération alors s'autofinancera.

Veuillez agréer, Monsieur le Secrétaire Administratif, l'assurance de ma considération distinguée.



A. SAWA LUGO

AMPLIATION :

- Ministère du Plan
- Ministère de l'Economie et des Finances.

ANNEX B

ENTENTE FUND FOOD PRODUCTION LOAN

CERTIFICATION PURSUANT TO SECTION 611 (e) of the
FOREIGN ASSISTANCE ACT OF 1961 AS AMENDED

I, Albert R. Baron, Regional Development Officer for the Entente region, having taken into account among other things:

- A. The existence of viable agricultural development institutions in the Entente States, and the role which they can play in promoting a dynamic food production program in their respective countries;
- B. The requirement for additional sources of loan and grant funding if these agricultural development institutions are to be in a position to encourage and foster an increased level of production in staple food crops;
- C. The inclusion of provisions in the Plans of each of the countries for expansion of the food production sector and the promotion of small farmers to provide increased agricultural produce to urban areas;
- D. The importance which the Entente Fund in cooperation with the Member States accords to this program;

do hereby certify that in my judgment the Entente Fund and the Entente Member States have the financial capability and the human resource capability to implement, and effectively utilize the subject capital assistance project.

This judgment is based on the fact that:

1. The Entente Fund has agreed to make appropriate agreements with each of the Member States providing for criteria in accordance with its Loan Agreement with AID;
2. The cooperating institutions have at their disposition complementary financial and technical resources permitting them to undertake these expanded activities; and
3. The Entente Fund and the cooperating States wish to proceed with the development of their food production capacity.



Albert R. Baron
Director; RDO/Niamey
Niamey, Niger

ANNEX C

Project Authorization and Request for Allotment of Funds

AID Loan No. : AID-DLC/P-
AID Project No. :

Provided under : FAA Section 103, Food and Nutrition
Entente Fund - Food Production

Pursuant to the authority vested in the Administrator of the Agency for International Development (A.I.D.) by the Foreign Assistance Act of 1961, as amended ("the Act"), and the delegations of authority issued thereunder, I hereby authorize the furnishing of assistance pursuant to Part I, Chapter 1, Section 103 of the Act, to the Mutual Aid and Loan Guaranty Fund of the Council of the Entente States ("Cooperating Institution") of not to exceed Eight Million Seven Hundred Ninety Thousand U.S. Dollars (\$8,790,000) ("Authorized Amount") to assist in financing certain foreign exchange and local currency costs of goods and services required for the activities described in the following paragraphs.

The purpose of the project for which these funds are authorized is to assist the Entente States (Benin, Ivory Coast, Niger, Togo and Upper Volta) to make necessary adjustments in their agriculture sector policies which will enable them, with the assistance of the Cooperating Institution, to implement a strategy of assistance to small farmers and to evaluate its effectiveness as a means of meeting the needs of the Entente States for increased food production. To accomplish the foregoing, the Cooperating Institution will use AID Loan funds to make sub-loans to the Entente States to carry out small farmer food production projects, financing the dollar and other foreign currency costs of procurement of equipment and materials, as well as the local currency costs of the sub-projects. The Cooperating Institution will use the technical assistance Grant to finance the services of a project management team in the Entente Fund, experts to conduct the sector assessment, and other contractors; local agricultural and sociological research in support of sub-project design, implementation and evaluation; seminars and other exchanges of information among African and international agricultural institutions, the Entente Fund, and the Entente States; and training to increase the independent capability of the Entente States to plan, implement, and evaluate small farmer food production projects.

Of the Authorized Amount, Eight Million U.S. Dollars (\$8,000,000) (the "Loan") will be loaned to the Cooperating Institution.

I hereby authorize incremental funding for the grant portion of the Authorized Amount (Seven Hundred Ninety Thousand U.S. Dollars) (\$790,000).

I. The Loan is subject to the following terms and conditions:

1. Interest Rate and Terms of Repayment

(a) The Cooperating Institution shall, in United States dollars:

- (1) repay the amount of the Loan to A.I.D. within forty (40) years, including a grace period of not to exceed ten (10) years;
 - (11) pay to A.I.D. interest on the outstanding disbursed balance of the Loan and on any interest accrued thereon at the rate of two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter.
- (b) The member states shall, in CFA francs (or such other currency as is legal tender in the member states of the Borrower):
- (1) pay to the Cooperating Institution an amount equivalent to each member state's share of the Loan within a period of not to exceed forty (40) years, including a grace period of not to exceed ten (10) years.
 - (11) pay to the Cooperating Institution interest on the unrepaid principal and on any interest accrued thereon at a rate not to exceed three and one-half percent (3.5%) per annum during the grace period, and three and one-half percent (3.5%) per annum during the repayment period.

2. Other Terms and Conditions

- (a) The Cooperating Institution's repayment of the amount of the Loan will be jointly and severally guaranteed by each of the five member states of the Cooperating Institution.
- (b) Based upon the justification set forth in section V.G. of Project Paper AID-DLC/P , I hereby conclude that exclusion of procurement from countries included in A.I.D. Geographic Code 935 would seriously impede attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program. Such Code 935 procurement, however, shall not exceed five percent (5%) of total loan and grant funds, up to two-thirds of which may be used to meet the transportation requirements essential to the success of the sub-projects and up to one-third of which may be utilized for technical service requirements if A.I.D. Geographic Code 941 procurement cannot be identified within a three-month period.
- (c) Except as authorized in paragraph 2(b) above, and except for local currency procurement, goods and services financed under the Loan shall have their source and origin in countries included in A.I.D. Geographic Code 941 and the member states of the Borrower.

Not less than ten percent (10%) of the amount of the Loan shall be used to finance goods and services of Code 941 source and origin. For the purposes of this Loan, goods and services procured in the member states shall be considered to be Code 941 procurement, except if they are procured in the member state in which the sub-project is located.

(d) Conditions Precedent to Disbursement

The usual legal opinions and documentation establishing the validity of the obligations of the Cooperating Institution (the Entente Fund) and guarantors (the member governments) will be required.

As a special condition precedent to disbursement of loan funds and capital grant funds, the Entente Fund will submit a specimen sub-project Agreement to A.I.D. for approval. The Entente Fund will also submit for A.I.D. approval a specimen letter or protocol outlining the criteria to be considered by the governments in developing applications for sub-projects, and defining eligible sub-projects which can be financed under the present project. A.I.D. reserves the right to review each subsequent sub-project Agreement to assure the preservation of the objectives of the original A.I.D. authorization.

(e) Covenants

The covenants of other A.I.D. loans to the Entente Fund with respect to use of funds will be made applicable to this new loan. These covenants include:

1. Sub-projects. The Cooperating Institution will use the proceeds of this loan and grant to make sub-loans and sub-grants to each of the Entente member states for the purposes described in Annex I, "Project Description", attached hereto, and in accordance with the procedures which are established in this Agreement and further described in Implementation Letters. The Cooperating Institution will also submit to A.I.D. for its approval a specimen of the sub-project Agreement which it intends to execute with the member states, as well as copies of all such agreements or amendments thereto which are executed.

2. Special Accounts. Until the loan is repaid, the Cooperating Institution agrees that all funds received from the member states in repayment of the obligations incurred under the sub-loan Agreements, and the income accruing from such funds, will be deposited in one or more special accounts. The Cooperating Institution agrees to use the funds in the special accounts and the income derived therefrom only for debt servicing of this loan and for other activities in support of the general purposes of this project to encourage small farmer food production in member states.

3. Additional Resources. The Cooperating Institution agrees to provide such additional resources to the member countries and the sub-borrowers in the nature of technical assistance, policy guidelines, coordination of activities and facts and statistics as is required to advance the project and as is consistent with resources available to the Cooperating Institution. The Cooperating Institution will exercise its best efforts to assure that the Recipient governments accept such resources and apply them diligently for purposes of the project.

4. Validity of Agreements. The Cooperating Institution and each of the Guarantors represent that the making and performance of this Loan Agreement have been duly authorized by all necessary governmental approval and do not contravene any law, regulation or contractual restrictions.

5. Organization, Authority and Operations. The Cooperating Institution and each of the Guarantors will attest to the validity of the organization, authority and operations of the Cooperating Institution and its administrative, technical, financial and legal ability to carry out the purpose of the Loan.

(f) The Loan shall contain such other terms and conditions as A.I.D. may deem advisable.

II. The Grant or Grants executed pursuant to this Authorization shall be subject, as appropriate, to the following terms and conditions:

- a) Same as item I 2(b) above.
- b) Based upon the justification set forth in section V.G. of Project Paper AID-DLC/P _____, I hereby conclude that exclusion of local currency financing and U.S. Code 941 procurement from grant funds would seriously impede attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program. Therefore, technical assistance grant funds may be used to finance local cost and U.S. Code 941 procurement.
- c) Same as item I 2(d) above.
- d) Same as item I 2(e) and 3 above.
- e) The Grant or Grants shall contain such other terms and conditions as A.I.D. may deem advisable.

Administrator

Date

Drafted: AFR/DR:JPleasler/TCrawford:REDSO/NA:5/9/76

<u>Clerks:</u>	AA/AFR:SScott	Date:
	AFR/GWR:DShear(draft)	Date: 4/9/76
	AFR/DP:RHessman(draft)	Date: 4/7/76
	AFR/OC:Thatsinger(draft)	Date: 4/7/76
	AA/PPC:FBirbaum	Date:
	PPC/DPRS:AHendly	Date:
	SER/FH:TBlacka(draft)	Date: 5/5/76
	SER/CM:JShollenberger(draft)	Date: 4/9/76

ANNEX D

page 2 of 4 pages

5. To evaluate small farmer food production projects financed by this and other sources of funds and to exchange on a regional basis the results of those evaluations so as to be able to incorporate them as appropriate into the design of subsequent projects;

6. In FY 1977, to begin a sector assessment which will refine the identification of constraints to small farmer food production and sharpen the focus of the solutions proposed;

7. To give increased emphasis in national manpower development policies to the allocation of resources to support training in fields directly related to small farmer development and food production.

In order to implement and test the new policy emphasis described above, the Entente Fund and the Member States will design, arrange financing for, execute, and evaluate a number of agricultural development sub-projects aimed at providing credit, technical assistance, and other necessary inputs to small farmers in order to eliminate the constraints which presently limit the level and efficiency of small-farmer production of staple food crops. To the extent that the evaluations of these sub-projects demonstrate the value of the strategy as a means of achieving the sector goal and meeting the Member States' needs for increased food production for domestic consumption, the Entente Fund and the Member States further commit themselves to the continued design, financing, execution, and evaluation of additional projects embodying the strategy in a manner consistent with the Member States' individual, national development priorities, institutions, human and natural resource endowment, and financial resource availabilities.

More specifically, each Member State will contribute as a minimum, approximately 20% of the subproject costs as well as, of course, being responsible for the provision of whatever additional financing which may be required following the termination of A.I.D. funding. A non-capital, but equally important contribution which the Member States will make will be the provision of candidates for training in small farmer development and food production and other personnel to assist in the design, implementation, and evaluation of subprojects focussing on small farmers. These candidates will also assist in designing policies to implement the strategy within national priorities and programs. In order to refine the basic strategy and the policies supporting it so as better to achieve the sectoral goal, the Member States will also meet at least once a year with each other, with the Entente Fund and A.I.D., and with other appropriate African and international agricultural research institutions in order to facilitate the exchange of information, review the findings of interim and final evaluations of subprojects financed by the Loan/Grant and of any other similar projects embodying the same fundamental strategy which are financed by their own or other resources, to discuss and coordinate the planning of basic and adaptive research which

ANNEX

page 3 of 4 pages

is being carried out or will be undertaken, to examine the bearing that the findings of this research have on actual and planned small farmer development projects or on the policies adopted in support of those projects, and to assist in the effective implementation of the sector analysis.

The Entente Fund will be the principal locus of project management and evaluation. It will make an annual contribution to the costs of the project from its own budget in the amount of approximately CFA 15,000,000 or more, as is consistent with its financial capability. Following the disbursement of the AID Technical Assistance Grant and through the tenth year of project implementation, the Entente Fund will continue to provide technical assistance to the project and to carry out the sector assessment as necessary, using for these purposes reflows resulting from the interest rate differential as well as available funds from its own budget. The Entente Fund will make another critical contribution, not only to the success of this project, but to the achievement of the broader sectoral goal as well, by virtue of the role it will play in organizing subproject evaluations and sponsoring seminars and discussions of the results of those interim and final evaluations, seeking to coordinate and tap the research being carried out by African and other international agricultural institutions in the Entente region, coordinating the training of Member State personnel to increase their independent capability to plan, execute, and evaluate small farmer food production projects, fostering other exchanges of information with a view to refining the basic strategy and achieving the sectoral goal, and in directing and coordinating the execution of the sectoral analysis.

To assist the Entente Fund and the Member States to make appropriate policy changes, to design, carry-out, and evaluate subprojects testing the responsiveness of the strategy of assistance to small farmers to the needs of the Member States for increased food production, and to carry-out the sector assessment in order to refine the basic strategy and the policies supporting it, A.I.D. has authorized a loan to the Entente Fund of \$3,000,000 in FY 1976. Subject to the future availability of funds and evidence that the project is proceeding toward its objectives, A.I.D. will authorize an additional \$5,000,000 tranche in FY 1977, and a final tranche of \$2,000,000 in FY 1978. In view of the fact that this loan financing will not be sufficient by itself to accomplish the objectives of the project, a technical assistance grant in the amount of \$790,000 has also been obligated for FY 1976. Subject to the future availability of funds, A.I.D. will also provide the following additional amounts of complementary financing in order to achieve the objectives of the project:

- 1) in FY 1977, a capital assistance grant in the amount of \$3,000,000

ANNEX D

page 4 of 4 pages

for subproject financing; and 2) in FY 1978, an additional capital assistance grant in the amount of \$2,000,000 as well as an additional technical assistance grant in the amount of \$890,000.

The above loan and grant funds will be used to finance the services of a project management team in the Entente Fund, experts to conduct the sector assessment, and other contractors; local agricultural and sociological research in support of subproject design, implementation, and evaluation; seminars and other exchanges of information among African and international agricultural institutions, the Entente Fund, and the Member States; training to increase the independent capability of the Entente Countries to plan, implement, and evaluate small farmer food production projects; dollar and other foreign currency procurement of equipment and materials; and the local currency costs of the subprojects.

A.I.D. will also participate in the periodic discussions of project results and assist in subproject evaluations.

CHECKLIST OF STATUTORY CRITERIA

In the right-hand margin, for each item, write answer or, as appropriate, a summary of required discussion. As necessary, reference the section of the Capital Assistance Paper, or other clearly identified and available document, in which the matter is further discussed.

The following abbreviations are used in the checklist:

FAA - Foreign Assistance Act of 1961, as amended

FAA, 1973 - Foreign Assistance Act of 1973

App. - Foreign Assistance and Related Program Appropriation Act, 1974

MMA - Merchant Marine Act of 1936, as amended.

I. FULFILLMENT OF STATUTORY OBJECTIVES

A. Needs Which the Loan is Addressing

1. FAA Section 103. Discuss the extent to which the loan will alleviate starvation, hunger and malnutrition, and will provide basic services to poor people enhancing their capacity for self-help.

2. FAA Section 104. Discuss the extent to which the loan will increase the opportunities and motivation for family planning; will reduce the rate of population growth; will prevent and combat disease; and will help provide health services for the great majority of the population.

3. FAA Section 105. Discuss the extent to which the loan will reduce illiteracy, extend basic education, and increase manpower training in skills related to development.

4. FAA Section 106. Discuss the extent to which the loan will help solve economic and social development problems in fields such as transportation, power, industry, urban development, and export development.

1. The purpose of the project is to increase the quantity and efficiency of food production by small farmers.

The project will alleviate hunger and malnutrition for these small farmers as well as the urban poor who will consume surplus production.

2. Not applicable

3. Small farmers will be introduced to more efficient food production techniques; agricultural planners, credit agents, extension agents and researchers will also receive training.

4. This loan will contribute directly to increased food production, marketing, and import substitution.

5. FAA Section 107. Discuss the extent to which the loan will support the general economy of the recipient country; or will support development programs conducted by private or international organizations.

5. See Part IV. D of the PP.

B. Use of Loan Funds

1. FAA Section 110. What assurances have been or will be made that the recipient country will provide at least 25% of the costs of the entire program, project or activity with respect to which such assistance is to be furnished under Sections 103-107 of the FAA?

1. Since this is a regional project, the 25 percent requirement does not apply; however a minimum 20% counterpart contribution is nonetheless required, and may well be exceeded.

2. FAA Section 111. Discuss the extent to which the loan will strengthen the participation of the urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life.

2. Subprojects financed under the project will strengthen the capacity of the rural poor to produce food for themselves and the urban consumer.

3. FAA Section 112. Will any part of the loan be used to conduct any police training or related program (other than assistance rendered under Section 515(c) of the Omnibus Crime Control and Safe Streets Act of 1968 or with respect to any authority of the Drug Enforcement Administration of the FBI) in a foreign country?

3. No.

4. FAA Section 113. Describe the extent to which the programs, projects or activities to be financed under the loan give particular attention to the integration of women into the national economy of the recipient country.

4. See Part IV. B. 1. of PP.

5. FAA Section 114. Will any part of the loan be used to pay for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?

5. No.

II. COUNTRY*/ PERFORMANCE

A. Progress Towards Country Goals

1. FAA Sec. 201(b)(5), 201(b)(7), 201(b)(8), 208. Discuss the extent to which the country is:

(a) Making appropriate efforts to increase food production and improve means for food storage and distribution.

Each of the Member States is implementing projects to increase food production. They are participating in the Entente regional live-stock program, are being assisted in numerous programs to increase rice, millet, sorghum, and production of other food crops. This project will complement these on-going efforts.

(b) Creating a favorable climate for foreign and domestic private enterprise and investment.

All of the Member States have a liberal policy for the promotion of private enterprise and are encouraging both foreign investors and national entrepreneurs. There are no specific restrictions concerning private enterprise development. AID is currently financing a private small enterprise program which has enhanced the role of private domestic enterprise.

* / As used herein, the term "country" shall mean the countries of Ivory Coast, Benin, Upper Volta, Niger and Togo. These countries comprise the "Member States" of the Borrower, the Mutual Aid and Loan Guaranty Fund of the Council of the Entente States.

(c) Increasing the people's role in the development process.

The Member States are cognizant of the necessity to mobilize the mass of people in overall development programs. As a result, considerable efforts are being made in the educational area and in a wide variety of rural development projects at the village level. This project will promote this effort.

(d) Allocating expenditures to development rather than to unnecessary military purposes or intervention in other free countries' affairs.

The level of military expenditures in the Member States is limited to that required to assure internal order and stability. See I.E.2. this Annex.

(e) Willing to contribute funds to the project or program.

Both the Borrower and the Sub-borrowers will contribute funds to the project. See Section IV. D.7 of PP.

(f) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangement; and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

The Member States generally have programs concerned with the more efficient control of government spending, the formation of a more equitable tax base, and more effective tax collection. Reasonable progress is being made as far as stability, freedom of expression and of the press, and as indicated above important programs are being carried out to train the people to productively assist in economic development. Private enterprise is encouraged both for national entrepreneurs and foreign investors.

(g) Responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

The countries are attempting through the building of a resource base by increasing export crops, through regional development programs, and agricultural projects at the village level, to effectuate economic and social reforms for the improvement of living standards.

Relations with the United States

1. FAA Sec. 620(c). Is the government indebted to any U.S. citizen for goods or services furnished or ordered where:
(a) such citizen has exhausted available legal remedies, including arbitration, or
(b) the debt is not denied or contested by the government, or
(c) the indebtedness arises under such government's, or a predecessor's unconditional guarantee?

None to our knowledge.

2. FAA Sec. 620(d). If the loan is intended for construction or operation of any productive enterprise that will compete with U.S. enterprise, has the country agreed that it will establish appropriate procedures to prevent export to the U.S. of more than 20% of its enterprise's annual production during the life of the loan?

No. The loan is intended for food production primarily for domestic consumption.

3. FAA Sec. 620(e)(1). Has the country's government, or any agency or subdivision thereof, (a) nationalized or expropriated property owned by U.S. citizens or by any business entity not less than 50% beneficially owned by U.S. citizens, (b) taken steps to repudiate or nullify existing contracts or agreements with such citizens or entity, or (c) imposes or enforced discriminatory taxes or other exactions, or restrictive maintenance or operation conditions? If so, and more than six months has elapsed since such occurrence, identify the document indicating that the government, or appropriate agency or subdivision thereof, has taken appropriate steps to discharge its obligations under international law toward such citizen or entity? If less than six months has elapsed, what steps if any has it taken to discharge its obligations?

No to (a), (b) and (c) to the best of our knowledge.

4. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property, and failed to take appropriate measures to prevent a recurrence and to provide adequate compensation for such damage or destruction?

No

5. FAA Sec. 620(l). Has the government instituted an investment guaranty program under FAA Sec. 221(b)(1) for the specific risks of inconvertibility and expropriation or confiscation?

There is an AID Guaranty Agreement between the United States and each of the Member States.

6. FAA Sec. 620(o). Fisherman's Protective Act of 1954, as amended, Section 5. Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters? If, as a result of a seizure, the U.S.G. has made reimbursement under the provisions of the Fisherman's Protective Act and such amount has not been paid in full by the seizing country, identify the documentation which describes how the withholding of assistance under the FAA has been or will be accomplished. No
7. FAA Sec. 620(q). Has the country been in default, during a period in excess of six months, in payment to the U.S. on any FAA loan? No
8. FAA Sec. 620(t). Have diplomatic relations between the country and the U.S. been severed? If so, have they been renewed? No
9. Relations with Other Nations and the U.N.
1. FAA Sec. 620(i). Has the country been officially represented at any international conference when that representation included planning activities involving insurrection or subversion directed against the U.S. or countries receiving U.S. assistance? No
2. FAA Sec. 620(a), 620(ii). Has the country sold, furnished, or permitted ships or aircraft under its registry to carry to Cuba or North Viet-Nam items of economic, military, or other assistance? No

3. FAA Sec. 620(u); App. 107.
What is the status of the country's U.N. dues, assessments, or other obligations? Does the loan agreement bar any use of funds to pay U.N. assessments, dues, or arrearages?

To the best of our knowledge, the Member States are up to date on their U.N. dues, assessments, and other obligations. The loan agreement limits the use of the funds to the importation of goods and services or the purchase of local goods and services for the program.

D. Military Situation

1. FAA Sec. 620(i). Has the country engaged in or prepared for aggressive military efforts directed against the U.S. or countries receiving U.S. assistance?

No

2. FAA Sec. 620(s). What is (a) the percentage of the country's budget devoted to military purposes, and (b) the amount of the country's foreign exchange used to acquire military equipment? (c) Has the country spent money for sophisticated weapons systems?

(a) The average percentage of the Member States budget devoted to military purposes is approximately 10%

(b) Most military equipment is provided through French assistance. Very little is purchased with the countries' foreign exchange.

(c) No

3. Is the country diverting U.S. development assistance or P.L. 480 sales to military expenditures?

No

4. Is the country diverting its own resources to unnecessary military expenditures?

No

III. CONDITION OF THE LOAN

A. General Soundness

-- Interest and Repayment

1. FAA Sec. 620.1(d), 201(b)(2). Is the rate of interest excessive or unreasonable for the borrower? Are there reasonable prospects for repayment? What is the grace period interest rate; the following period interest rate? Is the rate of interest higher than the country's applicable legal rate of interest?

Rate of interest is not excessive or unreasonable. Repayment prospects are favorable (see Section IV. E of PP. Loan is a two-step arrangement. Grace period to the borrower, the Entente Fund, is 10 years with 2% interest. During the remaining 30 years, interest is 3%. The second-step borrowers, the Entente government, will repay the loan to the Entente Fund in 40 years. Grace period is 10 years at an interest rate of 3%. Rate of interest is less than the maximum legal rate in the countries.

Financing

1. FAA Sec. 201(b)(1). To what extent can financing on reasonable terms be obtained from other free-world sources, including private sources within the U.S.?

The resources provided under this project are required and are in addition to those provided from other free world sources. Several donors are participating in the overall development of the Member States, and AID has agreed to consider this specific project.

Private financing for this project is not available.

-- Economic and Technical Soundness

1. FAA Sec. 201(b)(2), 201(e). The activity's economic and technical soundness to undertake loan; does the loan application, together with information and assurances, indicate that funds will be used in an economically and technically sound manner?

Yes. See Part IV of PP.

2. FAA Sec. 611(a)(1). Have engineering, financial, and other plans necessary to carry out assistance, and a reasonably firm estimate of the cost of assistance to the U.S., been completed?

See Part IV. of PP.

3. FAA Sec. 611(b); App. Sec. 101. If the loan or grant is for a water or related land-resource construction project or program, do plans include a cost-benefit computation? Does the project or program meet the relevant U.S. construction standards and criteria used in determining feasibility?

Not applicable.

4. FAA Sec. 611(c). If this is a Capital Assistance Project with U.S. financing in excess of \$1 million, has the principal A.I.D. officer in the country certified as to the country's capability effectively to maintain and utilize the project.

Yes

B. Relation to Achievement of Country and Regional Goals.

Country Goals

1. FAA Sec. 207, 281(a). Describe this loan's relation to:

a. Institutions needed for a democratic society and to assure maximum participation on the part of the people in the task of economic development.

This project has as one of its primary objectives the encouragement of small farmer participation in the countries overall economic development programs as set forth in their respective Plans.

b. Enabling the country to meet its food needs, both from its own resources and through development, with U.S. help, of infrastructure to support increased agricultural productivity.

The project will enable the Entente countries to meet an increasing proportion of its food needs through improvements in productivity as well as infrastructure.

c. Meeting increasing need for trained manpower.

Training programs and follow-through technical assistance to the small farmer as well as extension agents, agronomic researchers, and credit agents through this project. See Part III. C. of PP.

d. Developing programs to meet public health needs.

Not applicable.

e. Assisting other important economic, political, and social development activities, including industrial development; growth of free labor unions; cooperatives and voluntary agencies; improvement of transportation and communications systems; capabilities for planning and public administration; urban development; and modernization of existing laws.

The primary objective of this project is to encourage small farmer participation in productive activities.

2. FAA Sec. 201(b)(4). Describe the activity's consistency with and relationship to other development activities, and its contribution to realizable long-range objectives.

See Part II. 3 and IV. D. of PP.

3. FAA Sec. 201(b)(9). How will the activity to be financed contribute to the achievement of self-sustaining growth?

As indicated throughout the PP, this project will contribute to expanded food production which will be self-sustaining at the end of three years.

4. FAA Sec. 201(f). If this is a project loan, describe how such project will promote the country's economic development, taking into account the country's human and material resource requirements and the relationship between ultimate objectives of the project and overall economic development.

See Parts IV. B. and IV. D. of PP.

5. FAA Sec. 201(b)(3). In what ways does the activity give reasonable promise of contributing to development of economic resources, or to increase of productive capacities?

See Part IV. C. of PP.

6. FAA Sec. 281(b). How does the program under which assistance is provided recognize the particular needs, desires, and capacities of the country's people; utilize the country's intellectual resources to encourage institutional development; and support civic education and training in skills required for effective participation in political processes.

The program is designed to respond to small farmers' food production needs and capacities by utilizing the countries' intellectual and civic resources in agronomy, sociology, finance and agricultural development.

7. FAA Sec. 601(a). How will this loan encourage the country's efforts to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions?

The project will foster initiative and competition among food producers; encourage the use of credit unions, cooperatives and savings associations; discourage monopolies in food production and marketing; improve productivity in agriculture; and promote import substitution.

8. FAA Sec. 202(a). Indicate the amount of money under the loan which is: going directly to intermediate credit institutions or other borrowers for use by private enterprise; going directly to private enterprise; being used to finance imports from private sources; or otherwise being used to finance procurements from private sources.

Approximately 25% of the project funds will be made available to intermediate credit institutions for agricultural credit to private producers. At least 10% of the financing will be for imports from private sources in Code 941 countries. Up to 10% of Loan funds will be eligible for Code 935 procurement in the transportation sector. The remainder will be used to finance procurement from local sources.

9. FAA Sec. 611(a)(2). What legislative action is required within the recipient country? What is the basis for a reasonable anticipation that such action will be completed in time to permit orderly accomplishment of purposes of loan?

None required.

Regional Goals

1. FAA Sec. 619. If this loan is assisting a newly independent country, to what extent do the circumstances permit such assistance to be furnished through multilateral organizations or plans?

The Member States gained their independence in 1960. Assistance under the present loan amendment is to be furnished through the Entente Fund a multi-national organization.

2. FAA Sec. 209. If this loan is directed at a problem or an opportunity that is regional in nature, how does assistance under this loan encourage a regional development program? What multilateral assistance is presently being furnished to the country?

This loan is being made to the Mutual Aid and Loan Guaranty Fund of the Council of the Entente States, a regional organization representing the five Member States of Ivory Coast, Togo, Dahomey, Niger and Upper Volta. Regional cooperation is assured by this organization, and regional projects are eligible for assistance.

C. Relation to U.S. Economy

-- Employment, Balance of Payments, Private Enterprise

1. FAA Sec. 201(b)(6); 102, Fifth. What are the possible effects of this loan on U.S. economy, with special reference to areas of substantial labor surplus? Describe the extent to which assistance is constituted of U.S. commodities and services, furnished in a manner consistent with improving the U.S. balance of payments position.

See Section III.D. 6 of PP.

2. FAA Sec. 612(b), 636(h). What steps have been taken to assure that, to the maximum extent possible, foreign currencies owned by the U.S. and local currencies contributed by the country are utilized to meet the cost of contractual and other services, and that U.S. foreign-owned currencies are utilized in lieu of dollars?

No foreign currencies owned by the U.S. Government are available or could be used for the implementation of this project. The Member States will contribute to the support of the project and various incentives are available to assist private farmers.

3. FAA Sec. 601(d); App. 109. If this loan is for a capital project, to what extent has the Agency encouraged utilization of engineering and professional services of U.S. firms and their affiliates? If the loan is to be used to finance direct costs for construction, will any of the contractors be persons other than qualified nationals of the country or qualified citizens of the U.S.? If so, has the required waiver been obtained.

Not applicable.

4. FAA Sec. 608(a). Provide information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items.

This section is not applicable.

5. FAA Sec. 602. What efforts have been made to assist U.S. small business to participate equitably in the furnishing of commodities and services financed by this loan?

For imports into the Member States, AID's standard small business advertising requirements will be met.

6. FAA Sec. 621. If the loan provides technical assistance, how is private enterprise on a contract basis utilized? If the facilities of other Federal agencies will be utilized, in what ways are they particularly suitable; are they competitive with private enterprise (if so, explain); and how can they be made available without undue interference with domestic programs?

Technical assistance from U.S. sources will be provided by U.S. private firms and personal services contracts.

Facilities of other Federal agencies will not be used in the project.

7. FAA Sec. 611(c). If this loan involves a contract for construction that obligates in excess of \$100,000, will it be on a competitive basis? If not, are there factors which make it impracticable?

Not applicable.

8. FAA Sec. 601(b). Describe the efforts made in connection with this loan to encourage and facilitate participation of private enterprise in achieving the purposes of the Act.

This encouragement of private farmers' production is the primary purpose of this project. See Section III and IV of PP.

- Procurement

1. FAA Sec. 604(a). Will commodity procurement be restricted to U.S. except as otherwise determined by the President?

Yes. Commodity procurement will be restricted to Code 941 countries and the Member States, except for limited Code 935 Procurement in the transport sector.

2. FAA Sec. 604(b). Will any part of this loan be used for bulk commodity procurement at adjusted prices higher than the market price prevailing in the U.S. at time of purchase?

No.

3. FAA Sec. 604(e). Will any part of this loan be used for procurement of any agricultural commodity or product thereof outside the U.S. when the domestic price of such commodity is less than parity?

No

4. FAA Sec. 604(f). Will the agency receive the necessary pre-payment certification from suppliers under a commodity import program agreement as to description and condition of commodities, and on the basis of such, determine eligibility and suitability for financing?

Not Applicable

Other Requirements

1. FAA Sec. 201(b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year?

In view of the regional character of the proposed AID assistance, the loan falls outside the limitation and is classified as an African Regional project.

2. App. 105. Does the loan agreement provide, with respect to capital projects, for U.S. approval of contract terms and firms?

Not applicable.

3. FAA Sec. 620(k). If the loan is for construction of a productive enterprise, with respect to which the aggregate value of assistance to be furnished will exceed \$100 million, what preparation has been made to obtain the express approval of the Congress?

Not applicable.

4. FAA Sec. 620(b), 620(f); App. Sec. 109(b). Has the President determined that the country is not dominated or controlled by the international Communist movement? If the country is a Communist country (including, but not limited to, the countries listed in FAA Sec. 620(f) and the loan is intended for economic assistance, have the findings required by FAA Sec. 620(f) and App. Sec. 109(b) been made and reported to the Congress?

Yes

5. FAA Sec. 620(h). What steps have been taken to insure that the loan will not be used in a manner which, contrary to the best interest of the United States, promotes or assists the foreign aid projects of the Communist-block countries?

The standard AID loan provision will be included in the loan agreement.

6. FAA Sec. 636(i). Will any part of this loan be used in financing non-U.S.-manufactured motor vehicles? If so, has the required waiver been obtained?

Yes. The required waiver will be obtained.

7. FAA Sec. 620(g). Will any part of this loan be used to compensate owners for expropriated or nationalized property? If any assistance has been used for such purpose in the past, has appropriate reimbursement been made to the U.S. for sums diverted?

No

No such assistance has been used for this purpose.

8. FAA Sec. 201(f). If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise?

The principal beneficiaries of the loan funds will be private farmers in the Member States.

9. App. Sec. 104. Will any funds under the loan be used to pay pensions, etc., for persons who are serving or who have served in the recipient country's armed forces?

No.

10. MMA Sec. 901.b. Does the loan agreement provide, for compliance with U.S. Shipping requirements, that at least 50% of the gross tonnage of all commodities financed with funds made available under this loan (computed separately by geographic area for dry bulk carriers, dry cargo liners, and tankers) be transported on privately owned U.S.-flag commercial vessels to the extent such vessels are available at fair and reasonable rates for U.S. flag vessels?

Yes.

LOGICAL FRAMEWORK

est. Project Completion Date: October 1981
Date of this Summary: March 24, 1976

FOR
SUMMARIZING PROJECT DESIGN

Project Title: Entente Food Production

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program Goal: The broader objective to which this project contributes:</p> <p>To increase the per capita production of staple food crops for domestic consumption.</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> 1. Comparison of year-one crop production figures with end-year figures shows increase for staple goods (one or more crops per country). 2. Average annual growth rate of food production (calculated from above) is in excess of current population growth rate. 3. Increments in food production not being exported. 	<p>Baseline and subsequent national agricultural, demographic, and trade statistics.</p>	<p>Concerning long-term value of program/project:</p> <p>Increased per capita food production is an economically sound target, that is, the Entente countries have a comparative advantage in food crop production.</p>
<p>Project Purpose:</p> <p>To assist the Entente Countries to make necessary adjustments in their agriculture sector policies which will enable them, with the assistance of the Entente Fund, to implement the strategy of assistance to small farmers and to evaluate its efficacy as a means of meeting their needs for increased food production.</p>	<p>End of Project Status:</p> <ol style="list-style-type: none"> 1. The Entente Fund, as appropriate, and the Member States will have made policy changes in agriculture sector resulting in: <ol style="list-style-type: none"> A. Greater emphasis in national and other programs of research to ways of improving small farmer food production. B. Food production components incorporated into existing cash crop production schemes. C. Small farmer credit policies adjusted with respect to terms offered borrowers and financial incentives to credit institutions to institutionalize supply of credit. D. Programs of small-farmer-oriented research being coordinated in region. 	<ol style="list-style-type: none"> 1. Semi-annual report of Entente Fund's project management team. 2. Plans and reports of African and international agricultural and sociological research institutions. 3. Reports of national Ministries of Agriculture and credit institutions. 4. Reports of national Ministries of 	<ol style="list-style-type: none"> 1. Rainfall is adequate. 2. Small farmers will be responsive to packages of improved technologies and inputs and will take advantage of easier access to and greater availability of agricultural credit.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	<p>End of Project Status: (continued)</p> <p>E. Small farmer food production projects being systematically evaluated and results fed into new project design.</p> <p>F. On-going process of sector assessment established.</p> <p>G. Greater allocation of national training resources to fields directly related to small farmer development and food production.</p> <p>2. Entente Fund, as appropriate, and Member States designing, seeking financing for, implementing, and evaluating additional small farmer food production projects.</p>		
<p>Inputs:</p> <p>Small farmer food production projects studied, designed, implemented, and evaluated in each Member State.</p> <p>Increased capability of Entente Fund and national authorities of agriculture and/or rural development to design, implement, and evaluate small farmer food production projects.</p> <p>Ongoing sector assessment findings and meetings to exchange information. Concrete results of subproject evaluations to other countries, institutions and joint future research as offered by Entente Fund, representatives of national authorities, and representatives of national organizations in region.</p>	<p>Measures of outputs:</p> <p>1. Ten donor-financed small farmer food production projects, primarily in Senegal, Ivory Coast, and Togo.</p> <p>2. Ten donor-financed small farmer food production projects, primarily in Niger and Upper Volta.</p> <p>3. Meetings, seminars, and other exchanges of information organized and held at least annually.</p> <p>4. Ten bi- or multi-national meetings to discuss design, implementation and food production issues in more developed countries.</p> <p>5. Ten research findings seminars for host-country nationals and for research study visits.</p>	<p>1. Semi-annual project reports of Entente Fund.</p> <p>2. Reports and plans of African and international research organizations.</p>	<p>1. Training and experience of designing, implementing, and evaluating subprojects will be effective in increasing independent capability of Entente Fund and Member States to design, execute, and evaluate small farmer food production projects.</p> <p>2. Sector assessment, sociological and adaptive agricultural research, and subproject evaluations will provide results useful in refining the strategy of assistance to small farmer food producers.</p>

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Inputs: (continued)</p> <p>Short-term and long-term practical and academic training programs for personnel of concerned Member State ministries and agencies, in Entente Region and in U.S.</p>			
<p>Inputs: Types of Resources</p> <p><u>AID:</u></p> <p>A. Grant technical assistance - \$1,680,000</p> <p>B. Grant capital assistance - \$5,000,000</p> <p>C. Loan capital assistance - \$10,000,000</p> <p><u>Entente Fund:</u></p> <p>Minimum of F CFA 15,000,000 per annum</p> <p><u>Member States:</u></p> <p>A. 20% of sub-project costs</p> <p>B. Candidates for training</p>	<p>Timing of AID Inputs:</p> <p>1. <u>FY 1976</u></p> <p>A. Grant TA - \$790,000</p> <p>B. Loan CA - \$8,000,000</p> <p>2. <u>FY 1977</u></p> <p>A. Grant CA - \$3,000,000</p> <p>3. <u>FY 1978</u></p> <p>A. Grant TA - \$890,000</p> <p>B. Grant CA - \$2,000,000</p> <p>C. Loan CA - \$2,000,000</p>	<p>1. AID Controller Records</p> <p>2. Entente Project Management semi-annual reports</p>	<p>1. Competent project management team will be located.</p> <p>2. Financial inputs will be available in timely fashion.</p> <p>3. Member States' training candidates will be accepted by universities for long-term academic programs.</p>

ANNEX G
PROJECT PERFORMANCE TRACKING NETWORK (PPT)

Entente Countries	Project No.	Project Title:												Date: 3/29/76			(X) Original																	
		Entente Food Production															Revision																	
Year	CY 1976												CY 1977			CY 1978		CY 1981																
Month	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	3	1	2	3	4	5	6	7	8	9
Actions	1						4						8						10..						12.									
	Proj. approved						Cap. Grant						1st Subproject Agreement signed						Balance TA & Capital Grant funds obligated						TDD									
	2						5						9						11.															
	TA and Loan Agreement signed						TA begins						1st Subproject L/Comm. opened						Balance loan funds authorized															
	3						7																											
	Loan agreement ratified						Loan C.P.'s approved																											
	6																																	
	1st TA L/Comm. opened																																	
Financial Plan	/Auth. \$3.0m loan /Oblig. \$3.0m Cap. Grant												/Oblig. \$2.0 cap. grant, \$0.89m TA						/Auth. \$2.0m loan															
Evaluation	/Oblig. \$0.79m TA												/Auth. \$5.0m loan																					

CRITICAL POINT INDICATORS:

1. Approval of entire proposed loan/grant project and authorization of initial \$3,000,000 tranche of loan funds, 15 April 1976.
2. Grant agreement obligating initial tranche of \$790,000 for TA and loan agreement executed by AID and EF, 30 June 1976.
3. Loan agreement ratified by Member States, 30 September 1976.
4. Grant agreement obligating initial \$3,000,000 tranche of grant capital assistance funds executed by AID and EF, 31 October 1976.
5. Project Management Team on board; begins work on subproject design, 1 November 1976.
6. First Letter of Commitment opened for Technical Assistance Team, 15 November 1976.
7. C.P.'s to disbursement of loan approved, 31 December 1976.
8. First subproject agreement signed with a Member State, 1 March 1977.
9. First Letter of Commitment for a subproject opened, 15 May 1977.
10. Remaining TA and Grant capital assistance funds obligated, 31 October 1977.
11. Remaining loan funds authorized, 31 March 1978.
12. Terminal disbursement date for loan funds, 30 September 1981.

UNCLASSIFIED

AFR/CUR:FGILBERT:JMCS
6/4/75 EXT 28240
AA/AFR:SCADAMS

TAWAGR:SLITZENBURGER (DRAFT)
AFR/DS:JPIELEMEYER (DRAFT)
GG/AFR:TRUNTSINGER (DRAFT)
AFR/CUR:DSHEAR (DRAFT)

AFR/DP:RIHESMANN (DRAFT)
AFR/DS:PLYMAN (DRAFT)
PPC/DPR:JHELTY (DRAFT)
AA/AFR:DBRON

ROUTINE ABIDJAN

ROUTINE NIAMEY, OUAGADOUGOU, LOME, COTONOU, PARIS

AIDAC

E.O. 11652: N/A

TAGS:

SCA
FG
DB

SUBJECT: ENTENTE FOOD PRODUCTION AND AGRICULTURAL CREDIT PRP
PARIS FOR HELMAN

1. PRP REVIEWED BY PROJECT COMMITTEE ON FEBRUARY 21 AND FOUND TO BE EXCEPTIONALLY WELL AND THOUGHTFULLY PREPARED. COMMITTEE CONCURRED IN TWO PHASE APPROACH. BECAUSE POST-PONEMENT UNTIL FY 77 OF PHASE II GRANT AND LOAN AUTHORIZATIONS SEEMED LIKELY DELAY UNNECESSARILY IMPLEMENTATION BETT BETTER DEVELOPED IVORY COAST SUB-PROJECTS, INITIAL TRANCHE OF OF PHASE II LOAN (DOLS 3 MILLION) AS WELL AS PHASE I TA GRANT (DOLS 790,000) CARRIED IN FY 76. OP. THOUGH COMMITTEE COMMITTEE'S INITIAL INCLINATION WAS TO HAVE SEPARATE PP'S FOR PHASES I AND II, AID/W HAS SINCE DECIDED TO FIELD DESIGN TEAM CHARGED WITH PREPARATION SINGLE, COMPREHENSIVE PP ENCOMPASSING PHASE I TA PLUS GRANT AND LOAN FINANCING FOR PHASE II SUB-PROJECTS. WHETHER PHASING OF AUTHORIZATIONS SHOULD REMAIN AS INDICATED IN CP WILL BE DECIDED ON BASIS DESIGN TEAM'S RECOMMENDATIONS CONCERNING FY 76 CAPITAL GRANT AND LOAN FUNDING REQUIREMENTS AND ON BUDGETARY AND LEGISLATIVE CONSIDERATIONS.

FORM DS 322A(OCR)

UNCLASSIFIED

1
2

2. FOLLOWING ITEMS COVER MAIN POINTS DISCUSSED BY REVIEW COMMITTEE AND THE CONSENSUS REACHED ON EACH. THESE RECOMMENDATIONS ARE TO BE FOLLOWED IN THE DEVELOPMENT OF THE PP FOR PHASES I AND II:

{A} WITH REGARD TO PHASE I, AID/W HAS DIFFICULTY IN CONCEPTUALIZING HOW FIELD TRIALS COULD BE USEFULLY CARRIED OUT IN RELATION TO EXISTING REGIONAL PROGRAMS AND IN ADVANCE OF REASONABLY FIRM DECISIONS CONCERNING SUB-PROJECTS TO BE SUPPORTED IN EACH COUNTRY. AID/W DOES NOT NECESSARILY SUGGEST ELIMINATION OF BUDGET ITEMS FOR THIS PURPOSE BUT DOES RECOMMEND STRONGLY THAT ANY PROVISION FOR FIELD TRIALS IN PHASE I PP SHOULD BE SUPPORTED BY HIGHLY SPECIFIC STRATEGY REFLECTING DUE PROVISION FOR COORDINATION WITH RELATED REGIONAL RESEARCH PROGRAMS (E.G., NIGER CEREALS PROGRAM, UARDA, IITA, ETC.). PP DEFICIENT IN DISCUSSION OF USE OF PHASE I TRAINING FUNDS. THIS SHOULD BE ADDRESSED IN PP AND ANY INCREASE IN PHASE I TRAINING BUDGET WOULD REQUIRE HIGHLY SPECIFIC STRATEGY FOR ITS UTILIZATION.

{B} THERE WAS CONCERN REGARDING NATIONAL GOVERNMENTS' CAPABILITIES FOR MANAGING PHASE II SUB-PROJECTS. ALSO IT WAS NOTED THAT SUB-PROJECTS APPEAR STRICTLY OF CAPITAL NATURE. AID/W CONCURS THAT MAIN PURPOSE PHASE II LOAN AND GRANT IS FINANCE CAPITAL-TYPE SUB-PROJECTS, BUT ALSO CONCERNED THAT RELATED TECHNICAL ASSISTANCE REQUIREMENTS NOT BE NEGLECTED. THEREFORE, RECOMMEND PORTION PHASE II GRANT BE RESERVED TO MEET LIMITED CONSULTANCY AND TRAINING ASSISTANCE REQUIREMENTS ASSOCIATED WITH SUB-PROJECTS IN ALL FIVE ENTENTE COUNTRIES.

{C} COMMITTEE CONSIDERED THE QUESTION OF WHETHER IT MAKES SENSE TO FINANCE SUB-PROJECTS ON A REGIONAL BASIS THROUGH THE ENTENTE FUND RATHER THAN ON A BILATERAL BASIS IN SOME OR ALL ENTENTE COUNTRIES. IT WAS CONCLUDED THAT THE BILATERAL FUNDING MECHANISM SHOULD BE RESERVED FOR SUPPORT OF INTEGRATED SECTORAL AND SUB-SECTORAL PROGRAMS SUCH AS THOSE BEING STARTED IN SAHEL COUNTRIES. NOTWITHSTANDING EXISTENCE OF BILATERAL FOOD SECTOR PROGRAMS IN NIGER AND UPPER VOLTA, COMMITTEE SEES NEED FOR TRANSFER OF RESOURCES THROUGH PHASE II GRANT TO SUB-PROJECTS WHICH ECONOMICALLY AND TECHNICALLY SOUND BUT, THOUGH CONSISTENT WITH SECTORAL PRIORITIES, DO NOT FIT WITHIN FRAMEWORK OF AID BILATERALLY-FUNDED PROGRAMS. FOR ALL FIVE COUNTRIES REGIONAL ENTENTE APPROACH OFFERS ADVANTAGE OF CONSOLIDATING MANAGEMENT UNITS AND, THEREBY, ECONOMIZING ON DONOR HUMAN RESOURCES NEEDED TO ASSIST IN PLANNING, REVIEWING, MANAGING AND MONITORING THEM.

UNCLASSIFIED

UNCLASSIFIED

{D} COMMITTEE REACHED STRONG CONSENSUS THAT ROLE OF AGRICULTURAL CREDIT IN SUBJECT PROGRAM SHOULD BE CONFINED TO ADDRESSING CREDIT NEEDS WITHIN CONTEXT INDIVIDUAL PRODUCTION-RELATED SUB-PROJECTS RATHER THAN FINANCING PURELY AGRICULTURAL CREDIT SUB-PROJECTS WHICH MIGHT, FOR INSTANCE, PROVIDE FUNDS FOR ON-LENDING BY AGRICULTURAL CREDIT INSTITUTIONS. THIS REFLECTS BELIEF IN AID/W THAT SUCH AN APPROACH WOULD INVOLVE DIFFICULT POLICY AND INSTITUTIONAL REQUIREMENTS WHICH UNLIKELY TO BE SUCCESSFULLY WORKED OUT DURING TIMEFRAME PHASES I AND II.

{E} IN CONSIDERING EXTENT TO WHICH SUB-PROJECT APPROVAL SHOULD RESIDE WITH ENTENTE FUND, AID/W TOOK ACCOUNT OF AIM FOSTERING COLLECTIVE FOOD PRODUCTION PLANNING CAPACITY AND PRECEDENT ESTABLISHED UNDER TWO PREDECESSOR ENTENTE LOANS AS WELL AS NEED INSURE SELECTED SUB-PROJECTS ~~MEET~~ NORMAL STANDARDS OF VIABILITY PLUS REASONABLE CONFORMITY TO AID PRIORITIES EMBODIED CONGRESSIONAL MANDATE. BASIC INCLINATION IS TO WORK OUT FORMULA WHICH PLACES RESPONSIBILITY FOR SUB-PROJECT APPROVAL ON ENTENTE FUND SECRETARIAT WHILE RETAINING OPTION OF INVOLVING RESIDUAL AID APPROVAL RIGHT SHOULD EXPERIENCE SO INDICATE. ONE ILLUSTRATIVE APPROACH WOULD BE TO PROVIDE IN GRANT/ LOAN AGREEMENTS THAT SUB-PROJECT APPROVAL WILL BE LEFT TO EF SECRETARIAT BUT AID WOULD RESERVE RIGHT TO RECONSIDER SITUATION BASED ON EXPERIENCE EVIDENCED IN QUARTERLY REPORTS. IMPLICATION WOULD BE THAT AID WOULD NOT INVOKE ITS RIGHT TO SUB-PROJECT REVIEW/APPROVAL UNLESS QUARTERLY CONSULTATIONS INDICATE DEFICIENCIES IN EF DECISION MAKING MAY ALSO BE USE TO REQUIRE AID APPROVAL OF SUB-PROJECTS IN EXCESS OF CERTAIN DOLLAR AMOUNT. PP DESIGN TEAM WILL BE ASKED TO EXAMINE OPTIONS AND RECOMMEND FORMULA FOR PLACING MAXIMUM RESPONSIBILITY ON SECRETARIAT WITHOUT SIGNIFICANT RISK THAT UNSUITABLE SUB-PROJECTS WILL BE IRREVOKABLY APPROVED. BELIEVE THAT PRESENCE ON SECRETARIAT STAFF OF TWO AID ADVISORS WILL HELP INSURE SUCCESS OF SUCH AN APPROACH. EQUALLY IMPORTANT TO SUCCESS IN THIS AREA IS DEVELOPMENT OF SUB-PROJECT SELECTION CRITERIA WHICH EXPRESSIVE OF AID PRIORITIES AS WELL AS BASIC ECONOMIC, TECHNICAL AND MANAGERIAL STANDARDS OF SOUNDNESS. EARLY AGREEMENT ON GROUND RULES WITH REGARD TO BROADER POLICY ISSUES WILL FREE EF STAFF, INCLUDING AID ADVISORS, TO WORK IN MORE COLLEGIAL RELATIONSHIP WITH MEMBER GOVERNMENT COUNTERPARTS TOWARD REALIZATION ACCEPTED NORMS. THIS ESPECIALLY IMPORTANT SINCE PROGRAM SHOULD PLACE AT LEAST AS MUCH EMPHASIS ON IMPROVING INSTITUTIONAL CAPACITY OF MEMBER GOVERNMENT AGRICULTURAL SERVICES VIA TRAINING AND TECHNICAL ASSISTANCE AS ON ADDING STRENGTH EF STAFF. RECOGNIZING EXISTING DIF-

UNCLASSIFIED

4

FERENCES BETWEEN COASTAL COUNTRIES' PROJECT DEVELOPMENT CAPACITIES. PP SHOULD PROVIDE FORMULA FOR INSURING THAT NO MORE THAN 50 PERCENT OF TOTAL LOAN FUNDS FLOW TO ONE COUNTRY.

4. WITH RESPECT TO THE PROPOSED GRANT AND SUB-PROJECTS TO BE GRANT FUNDED, GC/AFR ADDS A QUALIFICATION AND CONCERN AS TO WHETHER THE QUESTION OF COMPLIANCE WITH FAA SECTION 101 (A)'S REQUIREMENT FOR ENGINEERING AND OTHER PLANS AND FIRM COST ESTIMATES PRIOR TO OBLIGATION OF FUNDS, AND APPROPRIATION ACTION SECTION 105'S REQUIREMENT FOR AID APPROVAL OF TERMS OF CONTRACTS AND CONTRACTORS ON CAPITAL PROJECTS, HAS BEEN OR WILL BE CONSIDERED IN CONNECTION WITH DESIGN OF THE SUBJECT PROJECT.

5. AS INDICATED SEPTELS, AID/W PREPARING FIELD DESIGN TEAM O/A JUNE 16. 44

ANNEX I

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

MEMORANDUM OF CONVERSATION

DATE OF MEETING: February 6, 1975

SUBJECT: Interest and Problems for U.S. Manufacturers to Maintain
Viable Dealerships in SAHEL Countries

PARTICIPANTS: Mr. George Maron - International Div., Ford Motor Co.;
Mr. Dale Harper - Foreign Distributorship - General Motors
Corps; Mr. Nicholas Lakas - Office of Commercial Affairs,
State Department

COPIES TO: GC/AFR, Mr. Edward Dragon; AFR/CWR, Mr. David Shear; AFR/RMS,
Mr. Frederick Hahne; MO/AFR, Mr. William Allic; EB/CBA
Mr. Nicholas Lakas; OPR/ST, Mr. Alvin Berstein; USIA,
Mr. D. Campbel; MO/OPM, Sahel File

1. Both Companies are very much interested in selling their products in the Sahel Countries, but efforts to do so have not been successful and it will take years to develop the markets.
2. It is U.S. Government policy to assist American Industry to promote the sale of U.S. manufactured commodities abroad by creating the desire thru U.S. Trade Exhibits. However, the budget for foreign Trade Exhibits has been severely curtailed and it is unlikely in the near future that a promotional undertaking will occur in any of the Sahel Countries because of OMB's insistence to maximize the use of funds where cost of displays will provide the greatest return for industry. Since it is unlikely that Sahel Countries will have an immediate viable economic structure that can pay for higher priced U.S. goods in the near future, U.S. industry will largely depend on U.S. Government and U.S. Contractors to show the "American Flag" for U.S. made products.
3. Each Sahel Country has strong economic and political ties to France. Where as some inroad has been made by the British made Landrover and the Japanese made Toyota vehicles, the success is attributed to the willingness to "flood the market" which can be made when losses are balanced off by profits elsewhere. U.S. industry is not structured for similar operations.
4. The following are some specific problems which Messrs. Maron and Harper have stated that affect the sale of vehicles in the Sahel Countries:

DRAFTING OFFICER: Robert H. Locke:gb

DATE OF PREPARATION: 2/13/75

UNCLASSIFIED

- a. U.S. made vehicles as well as vehicles made by their European subsidiaries are luxury items for sale. As luxury items, there is a high tariff, plus other add on accessorial charges that further prices U.S. products off the local market.
- b. Local dealers can not afford to tie up funds on U.S. products for an uncertain profitable market because the local economy is too poor.
- c. Dealers do not stock spare parts for the limited number of in-country U.S. vehicles.
- d. Dealers cannot keep trained manpower to service and maintain U.S. vehicles. The trained manpower leaves as soon as he is trained and boot-legs a shoddy business at a fraction of the authorized dealership price.
- e. Local garages in some Sahel Countries have emphatically told the U.S. Embassy not to bring any more U.S. made vehicles for repair because they neither had the parts nor the maintenance capability.

IVORY COAST: STATE OF AGRICULTURAL TECHNOLOGY

This country has been receiving a strong support in agricultural research from French organizations.

In 1972 the various research institutes in Ivory Coast were regrouped in the Ministry of Scientific Research.

The research institutes related with agricultural development are:

- 1) ORSTOM (Office de la Recherche Scientifique et Technique d'Outre-Mer), doing basic research on technical problems as well as in sociology and economics. This institute has done research in ecology, agronomy and socio-economics in Francophone countries.
- 2) IFCC (Institut Francais du Cafe et du Cacao). This institute, besides doing research on new varieties of coffee and cocoa, as well as other stimulant plants, also has under its organization multiplication of fields, experiment stations and training extensions service agents cooperating with SATMACI. The main research center is at Bingerville (Abidjan), with experiment stations at Divo (235.6 ha) and Abengourou (715 ha), multiplication stations at Zague and San Pedro, and other fields at Yamassoukro, Tiassale and Agboville.
- 3) IRAT (Institut de Recherches Agronomiques Tropicales), in charge of the following stations:
 - Bouake, main research center, in charge of annual food crops;
 - Tombokro, research on irrigated crops mainly rice, and also coffee and cocoa;
 - Ferkessedougou, research on sugar cane;
 - Man and Gagnoa, for crops in forest areas.
- 4) IRHO (Institut de Recherche pour les Huiles et Oleagineux), doing research on vegetable oils and oilseed plants, mainly oilpalm and coconut.
- 5) IRCT (Institut de Recherche du Coton et des Fibres Tropiclaes), with research programs on cotton and tropical fibers.
- 6) IRCA (Institut de Recherche du Caoutchouc en Afrique), with research on rubber in Africa.

Other agricultural research programs have been planned by ENSA (Ecole Nationale Supérieure d'Agronomie), National School of Agriculture of Abidjan, for the period 1975-76. The projects will be concerned with corn and soybeans: varietal selection according to ecological conditions, cultural practices, storage, water management, mechanization and economic impact on rural areas.

Considering food crops, IRAT has recently done a considerable amount of research, in rice, corn, yams, manioc, sugar cane and soybeans. The main criteria followed for all these crops were varietal selection for high yields, pest resistance, soil fertility, fertilizer trials, and some specific research on rice (rice resistance to drought and to pyriculariosis).

RICE

Trials with 24 varieties have been done for drought resistance either for rain fed rice or irrigated rice. The research began in 1973 and continues at present. No conclusive results have been reached, the main difficulty being the difference in the cycle for several of the 24 varieties tested. The tests were run in duplicate blocks, with sprinkler irrigation. The 24 day drought period was established from the 65th day until the 89th day after sowing. The experiments were run at Bouake station. Measurements were taken on the effects of drought on tillers, height, size of stems, dryness of leaves, size of leaves, dry matter, relative hydration of leaves, effects of drought on different development phases, effects on grain production, etc.

The varieties tested were: Zakpale, 63-68, Iguape Cateto, 63-104, OS-10-G1, Ikong Pao, IR-480, H-1716, Moroberekan, Palawan, IR-442, IR-8. It seems that the best resistance to different periods of drought was shown by the Palawan variety.

Concerning rice strains resistant to pyriculariosis, from 886 lines tested the most resistant ones were Zenith, Makeowhite, Ram Tulasi, Mamoriaka, Karia, Ca 902/b/3/3, Ca 435/b/5/1 and Ca 902/b/2/2. Several hybrids have been selected for rain fed rice. The best yields were obtained from: 63-104 x Lung Sheng/144-B with 4600 kg/ha, Carreon with 4900 kg/ha, SE-349-D with 4800 kg/ha and IR-52 with 4700 kg/ha. Early, medium and late varieties were tested.

Deficiencies in nitrogen, phosphorus and potassium have been tested in Khorogo, Daloa, Abengourou, Bondoukou, M'Bahiakro and Yabra field experiment stations. The tested varieties were IR5 and IR8. A response of 19-20 kgs of paddy per kg of nitrogen was obtained. No significant response for phosphorus and potassium was obtained except in M'Bahiakro station.

In irrigated rice, (1st cycle), the following varieties were tested in the same stations mentioned in the above paragraph: IR8 (average yield from the 6 stations = 6410 kg/ha), CICA 4 (average 5450 kg/ha), Jaya (average 6440 kg/ha), CS6 (average 5710 kg/ha), Chianan 8 (average 4470 kg/ha) and Tainan 1 (average 4530 kg/ha). In the second cycle and only at the Man and Khorogo stations, the average results for the following varieties were: IR-20 (average 5460 kg/ha), CICA 4 (average 4950 kg/ha), Ikong Pao (average 4530 kg/ha), DJ-3460 (average 5770 kg/ha), IR878 (average 4350 kg/ha) and IR 630 (average 4570 kg/ha).

Tests on herbicides gave good results with a mix of propanil and 2, 4, 5 TP at a rate of 3 liters/ha. With direct seeding, the herbicides Satrol and Roustar were both tested with good results. No economic studies were done.

Variety trials were done in 1974 with the following results:

IRAT 10: (Long Sheng 1 x 63-104 Senegal) rain fed variety, with 4819 kg/ha yield at a multiplication test. This variety has a potential yield of 5500 kg/ha.

IRAT 9: (Taichung Native No. 1 x RT 1031-69 Congo) rain fed with 4227 kg/ha. This variety has a potential yield of 6000 kg/ha.

IRAT 8: (Moroberekan x 63-105 Senegal), rain fed. In a multiplication test it reached a yield of 3247 kg/ha, and it offers a potential yield of 4500 kg/ha.

IRAT 13: (Mutant by gamma-rays from 63-83) The test at Bouake produced 5000 kg/ha. The potential yield of this variety is 6000 kg/ha.

Iguape cateto: Rain fed with 4474 kg/ha yield. Potential yield 5000 kg/ha.

Fossa: Rice for "bas-fonds" with 5290 kg/ha and a potential yield of 5500 kg/ha.

Jaya: Irrigated rice, average 10 varieties first cycle 6917 kg/ha, and average second cycle, 10 varieties, 5230 kg/ha. Potential yield 8000 kg/ha.

On-going programs for 1975 on rain fed rice:

Improvement of rice varieties resistant to drought, particularly Palawan variety which has already shown good characteristics;

Studies to determine water availability in soils for rain fed rice;

Selection of rice varieties resistant to Pyriculariosis, particularly IAC 25-64, Dourado Precoce, Pratao-Precoce and SE 349D;

Research on parental lines and criteria for their selection;
Research on African rice, their selection, and development of their genetic pool;

Continuation of research from 1974 selected lines of rain fed rice. Those varieties are:

LS x 104/80B/b, 100 days, 110-120 cms;
949m/1 (mutant from 63-83), 125 days, 100 cms,

both with a potential yield of 5 tons/ha resistant to Pyriculariosis and Rynchosporium. Other important lines:

Varieties with 110 days:

LS x 104 - 88B (100 - 110 cms);
LS x 104 - 97B (100 - 120 cms);
LS x 104 - 144B (90 - 100 cms),

all three lines with a potential yield of 5 tons/ha.

Among varieties with 125 days:

50/2 (IRAT 13), 50/3, 50/4: with a potential yield of 7 tons/ha.

Seed multiplication of IRAT 10 and IRAT 13 will be obtained this year.

Programs in herbicides for rain fed rice are on course.

A program for certified seed production has been established with SODERIZ.

Another series of research programs has been established for 1975 concerning irrigated rice:

One hundred varieties were selected from the 2500 sent by IRR1, well adapted to flooded rice. Several varieties are outstanding: CS5 and SE 349D highly resistant to neck-blast. The CS5, 120 days cycle, 100 - 120 cms, had yields ranging from 6.6 - 7.9 tons/ha. Also SE 349D had yields from 5.9 - 6.3 tons/ha. (107 - 113 days and 80 - 90 cms);

Research on fertilizer response on irrigated rice;

Research on herbicides on irrigated rice. Trials with "bentazon", "flourodifen-propanil" and "butachlor-propanil";

Certified seed programs for flooded rice. The RI multiplication of IR5, IR8, L78 and Fossa were available. For R2 certified seed IR5 - IR8 and Fossa were analyzed by SODERIZ and passed the standard test.

CORN

An extensive research program is being done by IRAT. Varietal selection trials, hybrids, synthetics, seed density trials, field trials under extensive cultivation, resistance to Puccinia polysora, and other genetic work covers a broad field of tests. Forty-one hybrids were tested, determining vigor, flowering cycle, height of plant, height of ears, pest resistance and cycle to maturity. The best results were obtained by the following hybrids:

- T100CI x (A6B x M162W) = 4680 kg/ha;
- T100CI x (A6B x RBO) = 4231 kg/ha;
- T100CI x (T11 x T12) = 4217 kg/ha;
- T100CI x (M164W x M848W) = 4751 kg/ha;
- T100CI x (T115 x M848W) = 4424 kg/ha;
- T100CI x (M848W x RBO) = 4339 kg/ha;
- (A6B x T100CI) x (C164 x RBO) = 4655 kg/ha;
- (A6B x T100CI) x (M164W x RBO) = 4485 kg/ha;
- (A6B x T100CI) x (T115 x RBO) = 4585 kg/ha.

All results were measured at 15% moisture. A set of nine hybrids was tested at the following stations: Bouake, Man, Gagnoa, Tombokro, Teheri and Ferkessedougou. The best two hybrids for each station were:

<u>Station</u>	<u>Hybrid</u>	<u>Yield (kg/ha)</u>
Bouake (1st cycle)	Tuxpeno brach. x (M164W x C164)	5738
	TB Synt. A x (M162W x M164W)	5547
Bouake (2nd cycle)	Tuxp. brach. Synt. A x (M162W x M164W)	5536
	(T11 x T12) x (A6B x M162W)	4877
Man	TB Synth. A x (M162W x M164W)	6315
	T100CI x (T11 x T12)	6007
Gagnoa	T100CI x (T11 x T12)	6016
	TB Synt. A x (M162W x M164W)	5534
Ferkessedougou	T12 x (C164 x T115)	6948
	TB Synt. A x (M162W x M164W)	6894
Tombokro (irrigated)	T100CI x (T11 x T12)	8277
	(T11 x T12) x (A6B x M162W)	8055
	(rain fed) Tuxp. brach. Synt. A x (M162W x M164W)	7812
Teheri	T100CI x (T11 x T12)	7304
	Tb x (M164W x C164)	5654
	(T11 x T12) x (A6B x M162W)	5276

Another series of trials were done at Bouake, Gagnoa and Man stations, to obtain hybrids with RF64W and Tuxpeno brachytico. Also another complex hybrid from CPJ was tested in order to obtain an early variety. Several composites were obtained with local and outside varieties. The local composites did not give good results (COB, CMN, CSPJ, CJIM, CBZF, CJ3F). At the Bouake and Ferkessedougou

stations thirteen varieties from IRAT research in other countries were tested. The best yields were from RF64w x F2834T (Ivory Coast complex hybrid) with 4466 kg/ha, BDS (from Senegal, complex hybrid) with 4128 kg/ha, JDS (complex hybrid, from Senegal) with 3896 kg/ha.

Tests on seed densities were done at the Tombokro station. The results were:

<u>Plants per ha</u>	<u>Yield kg cobs/ha</u>
62500	7860
50000	8190
41250	7580

The best selections were tried at San Pedro and Zagne stations. The results were:

<u>Varieties</u>	<u>Yield (kg cobs/ha)</u>	
	<u>San Pedro</u>	<u>Zagne</u>
IF	2904	2678
CJB	4076	5292
H507	4318	8649
T11 x T12	—	9093

Trials with fertilizers at Gagnoa (forest area), Ferkessedougou (savanna area), Beheke (central region) and Kiemou (Northern region) stations were done without significant results. Only at Kiemou was a significant result obtained by adding 100 nitrogen units.

At Man station, a rotation: rice, corn - soybean, rice, corn - cotton was tested. Also at Ferkessedougou the rotations were: rice, corn, sorghum, rice, cotton. Another test was done with yams, corn, cotton, and rice. The fertilizers included in this test were:

<u>Crops</u>	<u>Fertilizer (N - P - K)</u>
Yams	40 - 30 - 60
Corn	40 - 40 - 60
Cotton	30 - 45 - 45
Rice	33 - 40 - 40

Two more experiments were included with 15 and 30 tons of manure per ha, with mineral fertilizers. The results of all three trials were significant. Also the results with mechanized plowing at 25 cm deep were significant. The conclusion of this experiment was that it is possible to have permanent cultivation (no fallow) if fertilization and mechanical cultivation are performed properly.

In 1974 more than 250 new varieties, most of them from Latin America, were imported. Most of them were early varieties.

Recently, 25 new hybrids were produced and tested. The best results were obtained from:

<u>Hybrid</u>	<u>Yield (kg/ha)</u>
T11 x (M164W x C164)	5757
T11 x (C164 x M848W)	5491
T11 x (B1138T x I737TN)	5602
T12 x (B1138T x I137TN)	6267
T12 x (M164W x T115)	5818
T12 x (T115 x RBO)	5711

A program has started to produce open pollinated varieties, late types for the Northern region, and early varieties (90 days) for the central region.

YAMS

There is a collection of more than one hundred varieties, with some recently received from Cameroon. Clonal multiplication is taking place selecting those varieties which can be cultivated mechanically. Weeding operations are costly and cultivating is almost impossible. Therefore mechanization of this crop is limited to use of herbicides. A research program has started using herbicides. The BB Dato 20 variety is resistant to anthracnoses. Several toxicity trials were done with metribuzin. The above mentioned variety started showing toxicity symptoms at 8.4 kg/ha. At 12.5 kg/ha, 32% of the plants were damaged.

CASSAVA

A large collection of more than 85 varieties was submitted to selection trials.

The results of the two best varieties are:

<u>Yield in tons/ha</u>		<u>Varieties</u>	
		<u>CB</u>	<u>KATAOULI</u>
Harvesting:	at 10 months	26	24
	at 15 months	62	59
	at 20 months	84	72
<u>% of dry matter</u>	Harvesting: at 10 months	30	37
	at 15 months	31	39
	at 20 months	47	38
<u>% of starch over dry matter</u>	Harvesting: at 10 months	59	71
	at 15 months	68	72

Other Varieties:

Other trials were run starting in 1973. The yields after 20 months (April 1975) were not yet recorded.

<u>Variety</u>	<u>Yields in tons/ha</u>	
	<u>at 10 months</u>	<u>at 15 months</u>
CB	17.6	41.5
H43	13.1	24.9
H57	13.4	32.7

Another set of varieties were:

<u>Variety</u>	<u>Yields in tons/ha</u>	
	<u>at 10 months</u>	<u>at 15 months</u>
CB	17.3	60.0
Kataouli	16.2	39.6
Ilanera	1.0	5.7
Vira-Bora	2.2	10.3

So far the CB variety is giving consistant high yields.

SOYA BEANS

In trials done in 1973, early varieties were not successful. In the following table the best yields in 1973 and 1974 campaigns were (yields in kg/ha):

<u>Variety</u>	<u>1st cycle 1973</u>	<u>2nd cycle 1973</u>	<u>1st c. 1974</u>	<u>2nd c. 1974</u>
Bertoua	2170	1400	2500	3200
Improved Pelican	1850	1090	1687	1803
HStH	1400	960		
TK5	1830	1060		
CNS	1920	1200		
Kent			2180	1676
Jupiter			2340	1731
280-3			2000	2130
CES-486			2407	1940
Bossier			2627	1943

In 1973 the yields were somewhat lower than in preceeding years due to poor climate conditions.

Among these varieties, Bossier has good characteristics, homogeneous maturity and yellow grains. Bertoua, used as standard, still remains the best if compared with other varieties.

In density trials 250,000 - 300,000 plants/ha gave the highest yields. An inoculation strain G3, prepared by IRAT-Senegal, was not as successful as with Nitragin, the Rhizobien strain more frequently used. At ENSA (National School of Agriculture) a research program will start to test different strains of Rhizobium japonicum, best adapted to the local ecological conditions.

SUGAR CANE

The first appearance of smut in August 1972 led to the destruction of all trials and the creation of a new experiment station for this crop at Ferkessedougou. Nine new varieties were introduced in 1974:

B 60.267	MYZ 151	CB 40.19
B 52.230	Co 957	H 32.10.63
PR 1007	Co 775	PEPECUCA

The varieties on trial, N53.216 - Co 740 - TROJAN - TRITON gave good yields if compared to the standard. Two early varieties, RAGNAR and Q63, gave good results. In comparative trials with the standard NC0 310, two varieties also were superior: PR 1059 and Co449. The varieties Co449 and PR 1059 were given to SODESUCRE for their multiplication and further distribution to the farmers.

Concerning fertilizer trials, 150 kg/ha of nitrogen reached the economic level of response. Concerning phosphates, 100 kg/ha in new soil gave a 40% increase in yield.

In 6 industrial plots, the foliar analysis showed that the water balance was not sufficient for the needs of the plants. The phosphate fertilizer was adequate, and potassium fertilizer could be reduced.

The herbicide Metribusin, was superior to the formula Atrazine + Ametryne + 2-4D. Programs on varietal selection according to yields and resistance, fertilizers used for an industrial expansion.

SOIL FERTILITY

Research programs are under way to study soil fertility responses versus addition of nitrogen fertilizers and/or organic matter, mainly crop residues. These programs are carried in forest as well as in savanna soils. The effects on crops are studied after 6 cycles. At Teheri, in "ferralitiques" soils, silty-clayish-sandy, potassium deficiency was produced after the 3rd cycle of crops, and was severe after the 5th cycle. After one year fallow, the soil recovered. The yields in corn with deficiency in 1972 were 3050 kg/ha and after one year fallow, in 1974, 4000 kg/ha were obtained.

Concerning phosphates, in sandy soils, the effect is lost after four years. In soils with a medium retention capacity, the effects are noticeable after such a period. The gains in yield for 75 units of P_2O_5 were 0.5 tons/ha and with 300 units of P_2O_5 1.3 tons/ha. With a yearly fertilization of 25-30 kg P_2O_5 high yields can be obtained.

"Ferralitiques" soils were studied concerning their hydrodynamic properties and water retention capacities versus rainfed rice. Selection of rice varieties concerning soils with such characteristics is underway. Also cultural practices are studied for a better management of such soils. A rotation has been studied (rice - corn/cotton) in such soils to study the best methods for water management, in order to obtain the best yields for such crops.

Research on several cultural practices (plowing, rotator, etc.) are underway in gravel soils in the central region. The trials are done with rainfed rice, corn and cotton. Comparative results between plowing and hoeing shows a significant increase in yield by plowing. In general with gravel soils plowing at 30 cms gave the best results.

Research programs have been established on mechanization, either by animal traction or by tractors. This research expands to the farmer level in the Northern Central region. Most of the research is done on rainfed crops and rotations of such crops. Conservation of soil fertility, fertilizers and other cultural practices form part of this program. New varieties are tried to see their response with these mechanized methods. The management of a farm machinery lot, will be included in this project.

A similar project with the introduction of mechanized practices will be established in the Northern region.

The economical aspects of both projects are considered. The ownership of farm machinery by rural cooperatives is part of the package. Also cattle management by small farmers, for animal traction, is going to be studied. Related with this last project are the "systems to increase production in the Savanna Northern region." Although this project stresses cattle development and therefore pastures management, mechanized farming is also considered with rainfed crops. This project concerns a rural development of the area. A 60 HP tractor will be used to study this model.

COMMENTS ON AGRICULTURAL RESEARCH IN IVORY COAST

Most of the research in 1974 has been oriented to selecting high yielding varieties mainly in rice, corn, sorghum, cassava and soybeans. The screening has been done through former collections and new acquisitions sent by foreign countries and international organizations. Genetic programs to obtain new lines have been proven successful in some cases, especially in rice and corn.

To support the high yielding varieties programs, resistance to pests and also soil fertility and fertilizations were considered. In reviewing the reports, no economic studies have been done concerning production costs, cost-benefit ratios or other economic parameters that could be useful to the farmers.

Only in a few instances was seed multiplication of selected varieties for distribution to farmers mentioned. (SODERIZ and SODESUCRE).

The quantity as well as the quality of research is impressive, but there seems to be a gap between all these research programs and the practical way to use all the valuable findings. The small farmer is seldom considered.

If some of the selected high yielding varieties could be used by the farmers, no doubt great benefits could reach a large sector of the rural population.

In a practical way, distributing to farmers selected seeds would not be enough. High yields are not only the result of genetic factors that the selected seed carries, but also of a full technological package, carrying knowledge of soil and water management, cultural practices, fertilizers, pesticides, etc., and in most cases mechanized operations. Needless to say, proper advice on storage, transportation and marketing for every crop is also needed and should be provided to the small farmers.

The source of all this "local" knowledge should be through the personnel of the agricultural experiment stations.

It seems that in Ivory Coast, the administrative structure that could carry to the farmers the advantages shown at the research level for all these crops is missing.

Although some of the research centers have "extension units", the extension service has to be organized and a network of agricultural extension stations has to be established.

IRAT has done some research in cultural practices, but unfortunately the results reach a very limited number of farmers.

In reviewing the research programs considered for 1975, it seems that in a few programs stress is made on considering the small farmer as the beneficiary of such research, but one cannot infer that an organized program exists.

The missing link between research findings and the farmer who should benefit from them was recognized also by the Director of Agricultural research.

A reorganization of the Agricultural Research service is taking place now. Since the Research programs have been sponsored by the French government and French organizations, the research has generally been oriented to improving crops for export to France. Only recently has more attention been devoted to food crops.

Basic data for a sound agricultural development plan are still missing. As an example only a small surface of the Ivory Coast has detailed soil and land use maps. It seems that ORSTOM does not have the necessary funding, nor the laboratories and the technical personnel to carry on such an important task. In some areas of the country not enough agro-climatic data exist.

Concerning the Ivorian technical personnel, who should be prepared to furnish the staff in research, there is much to be desired. Most of the Ivorians have received a college level training at ENSA (National School of Agriculture), and some have gone to France for a higher degree in Agriculture (Ingenieur Agronome). Therefore it is apparent that the technical knowledge that exists in this country has come mostly from France. As a recent example: several students from ENSA were offered scholarships in the U.S. The Director of ENSA, who is French, denied the permission to the students with the excuse that the students could be trained in France. With excellent agricultural research programs going on at Universities and research institutes in many parts of the world, the practice of sending all Ivorian students to France seems to limit their knowledge and training.

At the research level, according to a confidential source at the Ministry of Agriculture, there are only four Ivorians with enough scientific training to perform research tasks, and two of them have administrative assignments!

IRAT was founded in 1960. It is hard to understand why in all these years more Ivorian personnel were not properly trained to carry on the most important task of a nation for development: agricultural research.

NIGER: STATE OF AGRICULTURAL TECHNOLOGY by Fred Derafols

The farming areas in Niger extend from the Southern area north to the 300-400 mm rainfall area or *sohyets*. The concentrated areas are found close to the rivers, mainly the Niger River, and wherever else water resources are available. According to the availability of water resources agriculture is practiced in the following areas:

1. The valley of the Niger River, including flood plains, terraces and shallow valleys;
2. The rivers Dargol, Serba, Gourbe and Diamongon, all tributaries of the Niger River;
3. Stream beds, with a variable water table (according to the rainfall), known as *Dallols*;
4. The *Diffa* region in the Lake Chad Basin area, around the *Kamadougou* River, which flows into Lake Chad.
5. On a microscale, seasonal water accumulation takes place in "*bas fonds*" (low lands), "*decrues*" (land close to dams or lakes, when the water level recedes), and "*cuvettes*" (low valleys seasonally flooded -- or with a high water table -- when the river's level is high). In areas corresponding to these categories, traditional agriculture can be found, with rice the most important crop.

Although to some extent traditional agriculture has expanded in these areas, a great potential for development is offered through modern water resources utilization.

Crops and Cultural Practices

Although no reliable statistics are available, it is estimated that about 2.7 million hectares are farm land, of which a large portion remains fallow. Millet and sorghum are cultivated during the short rainy season from June to September and cover approximately 90% of the cultivated land. Rice is cultivated in *bas-fonds*, *decrues*, *cuvettes* and in some irrigated areas. Cotton, tobacco, and peanuts are cultivated and considered as cash crops. Peanuts are cultivated mainly in the Southern provinces of *Zinder* and *Maradi*.

Food crops other than sorghum, millet and rice include maize, cassava and yams, which traditionally are cultivated on a subsistence basis. Melons, onions and cucumbers are the most important vegetable crops, although bell peppers, string beans, lettuce, etc. can be found around *Niamey* and other cities where irrigation systems are available. Alfalfa is cultivated as a forage crop in limited amounts, with six cuttings. *Niébé* (cowpeas) is also cultivated around villages interspersed with millet and sorghum. In minor amounts the following

crops are cultivated; gumbo, red pepper, tomatoes, fonio, wheat and sesame. Fruit production is limited to date palms, guavas, mangos, and some citrus fruits.

A large segment of the farming population is under subsistence agriculture. Production is influenced by ecological conditions, and there is little if any exchange between producing areas of the most basic raw materials such as food, clothing and shelter. The predominantly subsistence agriculture production methods remain most primitive. Cultural practices are traditional with practically no capital accumulation except for a few simple hand tools (hoes, scrapers and machetes).

The traditional cereal crops are cultivated in a primitive way, making holes in the soil with a hoe, depositing the seeds, covering the seeds with soil, and pressing the soil with the foot. With a few exceptions, where some form of mechanical plowing is used, the Nigerian farmer uses a special hoe for planting millet. Weeding is done either with a scraper or by hand. Besides weeding, scraping the surface of the soil has the added advantage of preserving the soil's moisture. Harvesting is usually done with a long knife or machete. Seed clearing is done either by hand or by flail threshing and winnowing. Some farmers use pedal operated machines for rice. Traditional storage consists of large clay bins or straw huts above the ground on a wood platform.

Traditionally, the farmers save their own seed with some criteria for selection, although the farmers are not aware of such factors as cross pollination in millet and sorghum.

Animal traction either for plowing or transport is practically non-existent. Most of the transport relies on camels and donkeys. It is estimated that only about one percent of the farmers have access to animal power.

Thus the state of agriculture in Niger is in the very early stages of the development process. A major breakthrough can be achieved to increase food production by establishing extension programs with some physical inputs derived from well planned research programs, in order to provide better yielding varieties in traditional crops, new cultural methods, improved water management, intermediate tools and equipment, animal and/or mechanical traction, and agricultural chemicals (fertilizers, pesticides, herbicides).

Undoubtedly one of the best incentives for the farmer would be to provide him with a well organized marketing system where surplus production can be channelled either to non-productive areas (cities) or eventually for export.

It is considered that the most effective impact for development should come from the research and extension components, supported by a proper farmer-oriented financial structure (credit, cooperatives, or corporations). Nigerian farmers have practically no capital, except their rights to work certain areas of land by virtue of traditional occupational claims, and a few simple hand tools.

NIGER: PRINCIPAL AGRICULTURAL CROPS, 1967/68 - 71/72⁽¹⁾

	1967/68	68/69	69/70	70/71	71/72
Production					
	<u>(in thousands of metric tons)</u>				
Food crops					
Millet	1,000	733	1,095	871	959
Sorghum	342	215	289	230	267
Cassava	169	198	197	182	166
Beans	119	101	127	114	104
Sugarcane	21	25	25	37	54
Onions	44	39	27	31	36
Rice	33	39	38	37	27
Potatoes	13	10	9	8	10
Corn	3	2	2	2	2
Cash crops					
Groundnuts (unshelled)	298	252	207	205	257
Unginned cotton	6	7	13	11	9
Area under cultivation					
	<u>(in thousands of hectares)</u>				
- Food crops					
Millet	1,865	1,895	2,272	2,310	2,356
Sorghum	530	557	596	593	579
Cassava	24	27	28	24	24
Beans	739	793	1,028	1,036	1,056
Sugarcane	1	1	1	1	2
Onions	2	2	2	2	2
Rice	12	15	16	16	17
Potatoes	1	1	1	1	1
Corn	5	4	3	3	3
Others (2)	3	4	7	29	30
- Cash crops					
Groundnuts (unshelled)	357	432	320	358	394
Unginned cotton	17	17	20	20	21

Sources: Ministère de l'Economie Rurale, Direction de l'Agriculture, Rapport Annuel Tome II Année 1971; and data provided by the Niger authorities.

(1) October 1 - September 30.

(2) Includes gumbo, red pepper, tobacco, tomatoes, fonio, wheat, sesame and other crops.

Present State of Agricultural Research in Niger

The Institut National de la Recherche Agricole Nigerienne (INRAN) or the Nigerien National Institute of Agricultural Research has been recently established, and is expected to supervise all Nigerien research activities by October 1, 1975, including the French sponsored organization, Institut de Recherche Agronomique Tropical (IRAT). INRAN, a semi-autonomous organization, is under the direction of the Ministry of Rural Economy. INRAN has at present only 9 trained Nigerien researchers, but within a two year period the research staff is expected to increase to 20. In the area of soil research, one technician has been trained at the University of Oklahoma (U.S.), two are receiving training in France and another in the U.S. In cereals, two researchers are receiving training in Canada (one in entomology and another in phytopathology). Two Nigeriens are receiving their training in France in animal husbandry. For rice research, two researchers are receiving training at the University of Oklahoma, one in genetics and the other in Economics. It is considered that for rice research the required staff should include three geneticists, three agronomists and one economist in addition to one expatriate.

IRAT operates a network of agricultural research stations in Francophone countries in Africa, and has been responsible for agricultural research in Niger during the last 14 years. Because no laboratories are available, all the agricultural research done by IRAT has been oriented towards field trials with varietal cultures, cultural practices, fertilizer trials, pest control, and preserving collections of varieties provided by international organizations, like International Rice Research Institute (IRRI - Philippines), Centro Internacional de Multiplicacion de Maiz y Trijo (CIMMYT - Mexico), International Institute of Tropical Agriculture (IIRA - Nigeria), Centro Internacional de Agricultura Tropical (CIAT - Colombia), and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT - India).

The IRAT central office is located in Niamey at the Ministere de l'Economie Rurale. The main research stations are located at Kolo and Tarna. The substations are in Magaria, Kawara, Kala-Pate and Simiri. Field trials were carried out at several other locations

Several areas of research were covered by IRAT in 1974. Research was done with millet, sorghum, corn, wheat, rice, niebe (cowpeas), peanuts, vegetable crops, pastures, sugar cane, and as a new introduced crop, soybeans. Several varieties of these crops were selected for trials in various locations and were based on field tests with maximum fertilizer conditions. The research program covers a wide range of activities besides the above mentioned ones.

These programs include climatology studies, soils and soil fertility, irrigation and water management, and cultural practices for most of the crops mentioned above.

The research at the Tarna station covers, in general, the major dry land crops like millet, sorghum, cowpeas, peanuts, soybeans and pastures. All millet research is done at the Tarna station, with trials at 17 other locations under different ecological conditions.

The research at the Kolo station covers irrigated crops, including studies on water management. The main crops studied at this station include rice, wheat and corn. Some tests with millet have also been carried out at this station, where one good variety (P3-Kolo) has been developed with excellent results.

In the following paragraphs a summary of IRAT's research is included to show the progress as well as the possibilities for further improvement of food production at the farmer's level.

Research on Millet

The millet breeding program has followed three main tracks of research:

1. Production of synthetic (composite) varieties;
2. Development of an adapted hybrid; and
3. Development of a dwarf millet variety with a high ear density.

The hybrids obtained by cross pollination are promising. Some hybrids tested gave yields as high as 4,680 kg/ha. The hybrid Nr. 74 has a 10 day shorter cycle. The foreign varieties tested are:

- 18 varieties from Nigeria
- 15 varieties from Zongo
- 7 varieties from Souna
- 2 varieties from Mali (M2D2 and MBBxM2D2)
- 1 variety from Upper Volta (Dori)

The program for dwarf millets at Tarna deals with work on the introduction of dwarfism carried by the gene D2 into the HKN and Ex. Bornu varieties. That operation will increase the collection of dwarf varieties at the stations. The existing collection includes: 1/2 Souna, 3/4 Souna and 1/2 HK. Self-pollination has been carried out in these five varieties. In a future research program hybrids will be obtained from these varieties.

In another program a selection has been made with yellow millet. Synthetics will be obtained after pure self-pollinated, entirely

yellow plants have been obtained from the varieties: Tamangi, HKN, Guerguera, and Souna. Tests will be done to find out if it is possible to obtain a white flour, without the risk of fermentation.

Field tests have been carried out with several new synthetics at the stations at Kolo, Bengou, Kala-Pate, Simiri, Kawara, Tarna and Magaria. The varieties tested were: P3-Kolo, HKN Synthetic Ibis, C.I.V.T.II, HKN, Ex. Bornu and Ankoutess. The results of these varieties in different stations correlated with local rainfall. Varieties HKN and HKP gave improved results versus the variety P3-Kolo which was used as a standard.

Different hybrids have been obtained by mixing existing varieties. Comparative tests have been carried out at Tarna and Kolo stations. At Tarna the highest yield of 3848 kg/ha was obtained with the Hybrid M2D2 and Souna 3. At Kolo the hybrid Dori x HKN gave 1483 kg/ha which was the best result among the 11 hybrids tested. A set of 9 hybrids was obtained from HKN at the Tarna station. The highest yield of 3485 kg/ha was obtained with the hybrid 115-4 x HKN. The P3-Kolo was used as a standard with 2951 kg/ha.

Trials with early varieties of millet were done in the northern provinces of Niamey, Dosso, Tahoua, Maradi and Zinder. The variety HKP gave the best results at Tahoua with 1434 kg/ha. This variety is ready for multiplication and further distribution to farmers. A collection of 165 strains from different varieties is kept at Tarna station. Millets from ICRISAT (India) resistant to Sclerospora and Claviceps have been included in their collection.

Fertilizer trials with millet in different types of soils were also done at Tarna, and at the substations of Niamey, Dosso, Maradi and Tahoua. The fertilizers used were triple-superphosphate and urea. The best result for sandy-dune soils were obtained with 35 kg/ha triple-superphosphate (15 units of P_2O_5) and 50 kg/ha of urea (22.5 units of N) spread at the sowing realm.

The Tahoua phosphate rock (tricalcium phosphate) has been used in several tests, with millet and peanuts. A linear effect has been obtained using large quantities of rock. The average results are:

Effects of Fertilizer on Yield of Millet

	<u>Fertilizer (kg/ha)</u>	<u>Yield (kg/ha)</u>
No fertilizer		1197
(45 kg/ha P_2O_5)	150 kg of phosphate rocks	1486
(90 kg/ha P_2O_5)	300 kg of phosphate rocks	1600
(135 kg/ha P_2O_5)	450 kg of phosphate rocks	1748

Due to the insolubility of tricalcium phosphate large amounts should be used to obtain results (66% P_2O_5 insoluble).

A great response to using nitrogen fertilizers was obtained when the rainfall was sufficient (497 mm at Tarna). If the straw was plowed under, much better results were recorded. Using 45 N kg/ha and no straw, 1574 kg/ha of millet were obtained. Using the same amount of N plus 10 tons/ha of straw, 1751 kg/ha of millet were obtained. In other words, nitrogen retention in sandy soils is increased by additional straw. Other trials were performed with nitrogen fertilizers plus manure in sandy soils, obtaining a linear effect with manure. An increase of 14.2% was reached with a maximum yield of 2242 kg/ha after using 120 kg/ha of nitrogen and 10 tons/ha of manure. Another experiment was carried out with nitrogen, manure and straw. Although the grain production remained substantially the same, a higher yield in straw was obtained (221% increased over the standard).

Tests on cultural practices, plowing and cultivating were also carried out. Plowing at 10 cm depth and cultivating at 5 cm produced significant results, with an increase in yield of 14.5% from plowing and 13.7% on cultivating compared to traditional methods. These results are an average of results from 1966-1973. Similar experiments were carried out with fertilizers. The increase in yield was 17.7% above the standard. These cultural practices are feasible with the use of animal traction (one ox).

Another trial was done on silty-sandy soils with P3-Kolo variety, with a standard yield of 921 kg/ha. After performing the two cultural practices, the yield increased up to 1494 kg/ha.

Although nitrogen fertilizer used on dwarf varieties produced increased yields, they were not enough to compensate the cost of the fertilizer. Trials with potassium, calcium and magnesium were also performed with no significant results. Other experiments were done at Tarna with a rotation with peanuts during a 6 year period. Significant results were obtained when millet was planted after peanuts.

Several other trials compared traditional cultural methods with modern techniques (plowing, cultivating, fertilizers and sowed treatment with pesticides). When the rainfall is sufficient, very high results (from 2500-3000 kg/ha) were obtained. Then experiments were done on sandy-dune soils. Similar good results were obtained in alluvial soils.

The results of all the above mentioned trials are summarized in recommendations to the farmers through the Extension Service personnel. These recommendations are:

Varieties: The P3-Kolo variety can be used in the provinces of Maradi, Dossou, South Tahoua, and Magaria. This variety responds better to fertilizers than the local varieties. The recommended variety for the Northern province is HKP.

Cultural Practices: At the end of April or beginning of May (dry season), cultivating either with the hoe or with animal traction will help to plow under the phosphate fertilizer.

It is advisable to sow at the beginning of the first rains (10-15 mm) and even in dry weather, before the rainy season starts. The seeds should be treated with 2 g/kg of seed of Thioral or Aldrey. The seed should be distributed in 10,000 holes (pocket)/ha at 1 m x 1 m each. Then holes should be distributed in a straight line to facilitate weeding by cultivating, and animal traction can be used. Plant clearing should be done between the 15th and 21th day after germination, thinning to 3 plants per pocket. Cultivating should be done 8 days after sowing and again 15 days later. Other cultivating passes can be done whenever it is necessary.

Millet responds favorably to organic matter, therefore manure, compost or peanut shells should be distributed in the field (around 6 tons/ha) before the first plowing or cultivating. Mineral fertilizers are recommended: 22.5 units of N/ha and 15 units of P_2O_5 /ha (50 kg/ha of urea and 34 kg/ha of triple-superphosphate). Phosphate fertilizer should be distributed before land preparation and urea after clearing as a dressing. If peanuts were the previous crop in the rotation 69 kg/ha of triple-superphosphate should have been distributed before the peanuts were sown, and urea should be distributed only to millet after clearing, as above indicated.

Research on Sorghum

The selection of varieties at the Tarna station is done on two types of sorghums: sorghum varieties adapted to valleys, and sorghum for dunes or sandy soils. The selection proceeds according to the following criteria: productivity, short stems, early maturity (50% from 60 to 75 days), size of seeds, reduction of anthocyanine spots, fungus resistant grain, pest resistant plants.

Sorghum for the Valleys

The research program done on this type of sorghum has been directed towards:

Studying the local sorghums
Introduction of foreign varieties
Selections of parental lines with or without
male sterility in order to obtain hybrids.

The study on local varieties, 61 Mourmoure and 24 Talabani, have led to the selection of 5 Mourmoures and 3 Talabani, with absence of authocyanine spots and with ivory color grains. The foreign collections were:

85 varieties from Purdue (U.S.A.)
39 varieties from Nigeria
200 varieties from Senegal

From these varieties, 26 were selected for multiplication. Crossings to obtain synthetics were done at Tarna and Kolo stations. Eight varieties were selected at Tarna with yields ranging from 4042 kg/ha up to 4990 kg/ha. The flowering cycle extended from 67 up to 70 days. None of the varieties were superior to the standard with 5 or 8 kg/ha. The station also has the variety C 9357 with 6300 kg/ha yield. Trials have been done at the substations of Bengou and Kawara.

Trials with very early varieties were done at Tarna, Kolo and Bengou. The variety IRAT S-10 with 68 days flowering period gave a yield of 5049 kg/ha.

Foreign varieties were selected for comparative trials at Tarna and Kolo stations. The variety IRAT S-10 used as standard gave the best result with 4969 kg/ha at Tarna, and the best at Kolo Station was Naga White from Ghana, with 4195 kg/ha.

Late varieties did not give good results.

Sorghum for Sandy-Dune Areas

Selection and crossings were done with local and Israeli varieties. At the Tarna station, the best result was obtained with the Bagoba variety with 200 kg/ha and 98 days flowering cycle.

Trials with fertilizers were done at Kawara on a silty-sandy soil with different rates of nitrogen (0 - 15 - 30 - 45 - 90 kg/ha) with the varieties Jan-Jare and L8 (137 - 62 x Jan-Jare). The best result was obtained with the L8 variety and 90 kg/ha of N producing 3597 kg/ha. The nitrogen response was linear.

Trials at Tarna on sandy soils were performed on different seeding densities (15 600 - 20 800 - 31 200 holes (pockets) per ha) and three rates of nitrogen (0 - 45 - 90 kg/ha). Although the sowing was done late (22/7) good yields of 3072 kg/ha were obtained with the highest sowing density. Nitrogen responds as a square function. The maximum yield was 2849 kg/ha with 90 kg of N/ha. Trials with several fertilizers, N - P - K - S did not give any response.

Sandy Soils Sorghums

The recommended varieties for sorghums on sandy soils are:

For the West Region, P2 Matankars (selected from Bagoba);
For Eastern and Central regions, Babadia Fara.

For rotation, sorghum can follow peanuts or millet. Planting sorghum after sorghum should be avoided.

The same cultural practices and fertilization as those mentioned above for millet can be used for sorghum.

Sorghum for Valleys

In areas where there are risks of flooding, the Jan-Jare varieties with a 90-100 days cycle would be the best adapted. The seeds should be sown at 0.8 m x 0.6 m or 21,000 holes (pockets) per ha, leaving 3 plants after thinning.

The best varieties for intensive agriculture are 137-62 and 137-32 x Jan-Jare, of average size, with a cycle of 90-100 days. Both these varieties gave better results than the local varieties. With these two varieties about 42,000 holes (pockets) per ha can be planted, leaving 3 plants after thinning. A rotation of sorghum after cotton or niebe (cowpeas) is recommended.

Cultural Practices

On heavy soils, plowing before rainy season is advisable. If the soil is too hard to be worked dry (Goulbi), plowing after the preceding crop is recommended. In other cases plowing should be done whenever the soil is suitable, and harrowing is recommended in order to have a good seed bed.

Thinning should be done 20 days after germination. Cultivating can be done like with millet. Recommended fertilization is 100 kg/ha of urea (45 units/ha) on the selected varieties 137-62 or 137-62 x Jan-Jare. The fertilizer should be applied before passing the second cultivator.

The needs for water for irrigation for the variety 137-62 for winter crops are:

For the first 30 days, 1100 m³/ha;

After the grain is recently formed (soft) (60 days),
2900 m³/ha;

While maturing, up until maturation, 1000 m³/ha.

The total amount of water required is then 5000 m³/ha.

Rice

Rice research is being done at the following stations:

1. Kolo, where rice research is done on the three types of cultivation:
 - a) irrigated rice
 - b) deep water rice
 - c) floating rice;
2. Libore, concentrating on irrigated rice (ADRAO program);
3. Daikena, research on deep water rice and floating rice (ADRAO or WARDA program).

Several varieties are being selected for different types of rice cultivation.

a) Varieties of irrigated rice:

1. Trials on dry season were done at the Libore station under the ADRAO program. The high yielding varieties selected were:

I. Kong Pao (IKP) with 6193 kg/ha (133 days cycle);

IR 20 with 5460 kg/ha (173 days cycle);

CICA with 5863 kg/ha (168 days cycle).

The IKP is the only one with a short cycle among the high yielding varieties, but the grain quality is poor. Other short cycle varieties are Sintane-Diofor with 131 days cycle and 3365 kg/ha, and H7 with 133 days cycle and 3347 kg/ha. Another trial has been conducted with late varieties, sown at the end of January, with medium to long cycles. The best high yielding varieties were:

IR8 with 8594 kg/ha;

DJ684D with 5546 kg/ha;

IR5 with 5541 kg/ha.

2. Varieties selected for rainy season:

The following early varieties were tested at the Libore and Kolo stations.

The best high yielding varieties at the Libore station were:

Ratna with 6495 kg/ha (125 days cycle);
Pusa 2-21 with 5674 kg/ha (125 days cycle);
IR22 with 4994 kg/ha (132 days cycle).

The Pusa 2-21 variety tested at Kolo with a 4130 kg/ha yield shortened its cycle to 115 days. At the same station Sintane-Diofor variety had the highest yield with 4730 kg/ha and 120 days cycle.

For medium cycle varieties, at the Libore station, the high yield varieties were:

IET 1991 with 5668 kg/ha (142 days cycle);
IR22 with 5392 kg/ha (135 days cycle);
IR8 with 5239 kg/ha (140 days cycle).

At the Kolo station the high yield varieties were:

IR8 with 3652 kg/ha (135 days cycle);
D52-37 with 2524 kg/ha (135 days cycle).

The poor results obtained at Kolo were due to poor weather conditions during the sowing season (from 15 to 30 July) with a high rainfall. Other trials have been done at Kolo station with African rice collection (ECUVRI/IRAT program).

b) Deep water rice trials:

Coordinated experiments have been done at Kolo, Molli and Daikena stations. A collection of 10 varieties has been tested with one meter deep water. The best high yielding varieties at Kolo station were:

D52-37 (Niger) with 9230 kg/ha (135 days cycle);
ED2 with 8454 kg/ha (149 days cycle);
D52-37 (ADRAC) with 8145 kg/ha (140 days cycle);
Gambiaka Kokoum (Mali) with 8035 kg/ha (149 days cycle).

At Daikena station the best varieties were:

C13-E3 with 3942 kg/ha (142 days cycle);
Bentoubala B with 3901 kg/ha (142 days cycle);
D52-37 (ADRAO) with 3840 kg/ha (140 days cycle);
D52-37 with 3513 kg/ha (135 days cycle).

3. Trials with floating rice:

The experiments were done at Kolo, Molli and Daikena stations. The best high yielding varieties for this type of cultivation were:

- Nang-Kiew (62-06) with 7422 kg/ha (163 days cycle);
- Khao Gaew (61-05) with 7001 kg/ha (163 days cycle).

At Daikena station the results were:

- Neang-Kheuw 5 with 5770 kg/ha (163 days cycle);
- Khao Gaew (61-05) with 5617 kg/ha (163 days cycle);
- Nang-Kiew (62-06) with 5371 kg/ha (163 days cycle).

The varieties Nang-Kiew and Khao Gaew performed very well at both stations.

Herbicide tests have been done at Libore and Kolo during dry and rainy season, with IR22 variety. Eleven herbicides were tested. Weeding by hand gave the best results, although no economic assessment has been done. In dry season the herbicides appear to have a detrimental effect on this crop.

Also pesticides tests have been done with HCH (5% Lindane) and Basudin. The variety tested was D52-37 at Kolo station. No significant result was obtained. No borer attack was present.

IRAT plans to carry out intensive research programs on rice, the most important ones being:

- Research on soil nutrient deficiencies with soil and foliar analysis;
- Research on fertilizers on the three types of rice cultivation (irrigation, deep water and floating rice);
- Research on rotations in irrigated rice. The rotation of rice (rainy season) and wheat (dry season) was tested;
- Research on water duties for the three types of rice cultivation, using a neutron probe; research on drought resistance for floating rice and deep water rice;
- Research on new varieties and production of mutations for further crossings (hybrids);
- Preparation of mother seeds for further multiplication and distribution to farmers (certified seeds);
- Milling tests for rice quality, measured in the small pilot plant installed at Niamey, according to varieties that show potential possibilities for distribution to farmers.

In order to accomplish such a vast program, more facilities are needed, in equipment, buildings and laboratories. At present no research laboratory is available in Niger.

Since 1969 an experiment has been in progress at the Kolo station to test the response to nitrogen in the soil with and without addition of nitrogen fertilizer, in order to study the evolution of fertility for several years. The fertilized plots receive 150 kg/ha of urea each year. The results show that no significant alteration in fertility was noticed in paddy, but in straw the quantities were consistently diminishing versus time.

Several varieties are recommended to farmers for the rainy season suitable to areas where rice is now planted. These are:

For floating rice: Nany-Kiew (62-06) — cycle 150 days;

For swampy rice: Sintane-Diofor — early variety, cycle 100 days;

For rice in river banks, when the water level is lower than one meter: D52-37, cycle 120 days;

For irrigated rice: D52-37 and IR22, cycle 120 days;

For the dry season: irrigated rice IR22, 140 days cycle, and IR8, 160 days cycle.

Cultural Practices

When there is no water control, sowing should be done without further transplant. That can be done either by hand in holes containing five grains at 0.20 m x 0.20 m (no thinning is necessary) or by sowing machines (type SAED) with 2 rows at 35 cms.

During the dry season, transplanting is recommended in 3 bunches separated 0.20 m x 0.20 m. That can be done also during the rainy season, as long as water control is possible (irrigation with pumps).

Weeding is to be done by hand and as soon as possible. After harvesting the panicles should be dried under shade.

Fertilizers are recommended according to variety. For D52-37 a dosage of 67 units per ha of nitrogen (150 kg/ha urea) is recommended. For short stem rice, like varieties IR8 and IR22, a larger dosage can be used, up to 135 units/ha of nitrogen (300 kg/ha of urea).

In traditional rice, the full amount of fertilizer can be used at the time of planting. In irrigated rice, 50% should be applied at the time of planting and 50% when tillers appear.

In aluvial soils phosphate and potassium fertilizers have no significant effect. In sandy and clayish soils from granite decomposition, like in certain areas around Libore - Saga, deficiencies in P_2O_5 are frequent, and the nitrogenous fertilizer should be distributed with 90 kg/ha of triple-superphosphate (40 kg/ha of P_2O_5).

Niebe (Cowpeas)

The varietal selection has been done with material provided by CNRA at Bambey, Senegal. The main objective of this research has been to select early varieties, with erect stems, close pods and ivory color grains. All the varieties have been checked versus TN 65-64 as a standard with an average yield of 2225 kg/ha.

In experimental plots the spacing was 0.5 m x 0.3 m, giving a higher plant density per ha.

The best results were obtained with the following varieties and locations:

Station	Variety	Yield (kg/ha)	Cycle (days)
Bengou	TN 98 - 63	3065	90
Kolo	Tn 88 - 63	3531	50
Simiri	TN 88 - 63	1066	50
Kawara	TN 88 - 63	3697	50
Tarna	TN 88 - 63	3711	50
Magaria	TN 88 - 63	1071	50
Kala-pate	TN 90 - 64	1478	50

The variety TN 88-63 has shown high resistance to drought.

According to different rainfall zones, the following varieties are recommended.

Zone between 300 and 400 mm: early varieties (70 days cycle) TN 36-64 and TN 88-62;

Zone between 400 and 500 mm: semi-early variety (90 day cycle) TN 4-69;

Zone with more than 500 mm: late variety (130-150 day cycle); TN 98-63.

It is recommended to farmers to have an average spacing of 0.6 m x 0.3 m and 3 grains per hole. As fertilizer, 75 kg/ha of super-triplephosphate (15 units of P_2O_5 /ha) should be used.

Two pesticides treatments are recommended; one at the beginning of flowering and the second 10 days later, with 1.05 kgs of Endosulfan (or 3 liters of Thymul) diluted in 150 liters of water, per ha, delivered with a sprayer type "Tachoma".

For proper storage, plastic bags (40 kgs) with 10 c.c. carbon tetrachloride in each, are recommended. To protect them against rats, the bags should be stored on a wood platform supported by 35 cms long metal rods.

Millet yields have been improved if niebe has been included in a rotation: Niebe, millet, millet, fallow, in sandy-dune soils, with a previous plowing 10 cms deep and cultivating at 5 cms deep after planting.

Peanuts

A varietal collection provided by the United States with early and medium varieties has been tested at Kawara, Magaria and Tarna stations. The results were highly encouraging:

Yields of Early Variety Peanuts (95 day cycle)

Varieties	(Kg/ha)		
	Locations		
	Kawara	Magaria	Tarna
Tifspan	3819	2303	3105
Spanette	3333	1921	3010
Spantex	3600	2049	2880
Spancross	3229	2269	3120
Spanhoma	3009	2326	3080
Argentine	2870	2340	2820
55-437 (standard)	3092	2208	3070
Rainfall (mm)	507	481	497

The results at Kawara station were obtained on sandy-silty soil. Tifspan presents a good average at the three locations. Spanhoma gave good results with low rainfall, during two years, but lower yields were obtained with normal rainfall.

Yields of Semi-early Varieties
(105 day cycle)

Varieties	(Kg/ha)			
	Locations			
	Kala-Pate	Magaria	Tarna	Bengou
Virginia Bunch 67	1091	2472	2565	1431
Early Runner	814	2056	2732	—
Florunner	872	3153	—	2111
Florispar	900	3486	3450	2653
47-16 (standard)	1672	2412	2025	1764
Rainfall (mm)	639	481	497	914

Florispan was the best variety at Magaria, Tarna and Bengou.

Other early varieties were tested, like 28-204 and 55-437, with 2627-2500 kgs/ha.

For late varieties, 57-442 gave 2845 kgs/ha at Tarna and 59-127 gave 2736 kg/ha at Bengou. The early variety 55-437 included in those trials gave the highest result at Magaria station with 2458 kg/ha.

Another test was done with peanuts for eating purposes at Bengou and Tarna stations. The best variety at both stations was NC-17 with 2565 kg/ha and 2940 kg/ha respectively.

The recommended varieties for further multiplication and delivery to farmers are:

For the Northern area with an average rainfall of 500 mm, varieties 28-204 and 55-437;

Central area: variety 47-16;

South of Dosso: variety 28-206;

Gaya area and areas with more than 700 mm rainfall: 48-37.

The farmers are advised to disinfect the seeds with 2% of Thiotal.

With the early varieties 28-204 and 55-437, best results were obtained with a planting rate of 166,000 plants/ha (0.4 m x 0.15 m).

For late varieties, like 47-16, 28-206 and 48-37, a plant density of 110,000 plants/ha (0.6 m x 0.15 m) has given the best results.

In most of the Niger soils 15 units of P_2O_5 /ha (75 kg/ha of superphosphate) is recommended.

Mais

Several tests for adaptability were run at the Kolo station. Unfortunately, 15 varieties were on salty soils, and the results were poor. The station is using the variety P3-Kolo as a standard for all trials.

Among synthetic hybrids obtained from Ivory Coast, IRAT experiments gave good results, most of them superior to P3-Kolo. The best hybrids were:

Turpeno brachy Tico x (M164w x C164), white grain with 4054 kg/ha (68 days cycle);

CPJ x (I 137 TN x H55), yellow grain with 3653 kg/ha (67 days cycle).

The P3-Kolo standard gave 1543 kg/ha (69 days cycle).

Other synthetic varieties from Nigeria, U.S.A., Ghana, Kenya and Benin 24 in total, gave lower results than the ones mentioned above.

Trials were done to evaluate the water requirements for this crop. The following results were obtained for the P3-Kolo standard variety:

	Daily Requirement			Requirement for Growing Cycle	
	Days	mm	m ³ /Ha	mm	m ³ /Ha
Sowing to tiller	30	6	60	180	1800
Tiller to flowering	20	8	80	160	1600
Flowering to ripening	40	12	120	480	4800
			TOTAL	820	8200

Wheat

Trials with varieties available at the Kolo station were done during the dry season 1973-74. Also a collection of new varieties was tested. The results were more consistent for the periods 1972/73 and 1973/74. The collection tested, originally came from CIMMYT (Mexico); 12 of these varieties were obtained through Senegal.

The best varieties were:

- Siete Cerros (Mexipak) with 6125 kg/ha (65 days cycle);
- Tousson Ex AN6 with 6293 kg/ha (68 days cycle);
- Tobari with 5959 kg/ha.

The best variety was Mexipak with a relation of straw to grain of 0.9.

The adapted Mexican varieties from Senegal gave still better results:

- (IR 64 x N 10 B) AN3 with 6328 kg/ha (67 days cycle) and a relation of straw to grain of 1;
- Mexipak with 6317 kg/ha (68 days cycle) and a relation of straw to grain of 0.9.

For traditional agriculture the "Florence Aurore" variety is recommended. For more modern intensive agriculture, Mexipak and Tousson Ex AN6 are the best.

The sowing season should start in early November. Small holes at 20 cm x 20 cm with 5 grains each gave the best results in "cuvette" soils. On irrigated areas double furrows separated 40 cms are recommended. The double furrows should be 10 cms apart, with plantings on a furrow every 10 cms.

Urea has given a good response when 75 kg/ha is spread before sowing and 75 kg/ha used as dressing before the tiller stage starts.

The following water distribution during the growing cycle has been observed with the variety "Florence Aurore":

	Daily Needs			Growing Cycle Needs	
	Days	mm	m ³ /Ha	mm	m ³ /Ha
Sowing to tiller	45	5	50	225	2250
Tiller to flowering	30	9	90	270	2700
Flowering to ripening	30	6.5	65	195	1950
			TOTAL	690	6900

Soybeans

At the Tarna station 17 varieties were tested. Even though the plants developed properly, fruit setting was very poor. The best results were obtained with the following varieties:

<u>Varieties</u>	<u>Cycle (Days)</u>	<u>Yields (kg/ha)</u>
ICA Teroa	50	662
Improved pellican	50	335
ICA Lili	50	312
Mandian	50	300
8-3 El 39823	50	295

The experimental conditions were not known. Therefore it is impossible to judge if these varieties are or are not adaptable. Given the nature of Niger's ecological conditions, it seems unrealistic to assume that soybeans can compete with peanuts, which are already well adapted to Niger's conditions.

Onions

Several trials for selection purposes were run in the dry and rainy season with local early varieties "Violet Galmi" and "Violet de Madaoua". Several crossings were obtained to improve the local material. The best results were obtained from the following improved varieties, all with 150 day cycles:

- IRAT 1 (Violet de Galmi) with 52,100 kg/ha at Tarna station;
The same variety at Kolo station with 68,400 kg/ha;
- The "Violet Madaoua" with 49,400 kg/ha at Tarna station;
- IRAT 2 (Blanc de Galmi) with 47,700 kg/ha at Tarna and 53,600 kg/ha at Kolo;
- "Blanc de Soumarana" with 39,000 kg/ha at Tarna and 50,300 at Kolo.

For practical purposes the early varieties (140-150 days cycle) Galmi and Madaoua have priority because they offer a good shelf life. For dehydration purposes "Blanc de Galmi" and "Blanc de Soumarana" offered the best results.

Although the American variety "Early Grano" is a high yielder and of good quality, the shelf life is very limited.

Transplanting should be done during the first two weeks of November, with a plant density of 500,000 plants/ha.

The total amount of water required is 7300 m³/ha in 24 irrigations.

The following water distribution is advisable:

Before transplanting: 500 m³/ha;

After transplanting: 320 m³/ha per week during 10 weeks;
300 m³/ha two times per week during
3.5 weeks;

250 m³/ha two times per week during
3 weeks.

Tomatoes

A collection of 25 varieties has been tested. The best results were obtained with the following varieties, all with a 85-125 day cycle: Piacenza 0135 with 77,000 kg/ha and average weight per tomato of 40 g., Gemed F with 66,700 kg/ha with an average weight of 30 g. and Marzanino with 66,700 kg/ha and 28 g. Those varieties are suitable for processing since the size of the fruit is too small, and the harvesting more expensive. The Rustrel F1 variety with 59,500 kg/ha with 59 g. weight per fruit offers better possibilities.

Different transplanting dates have been tested and much higher yields have been obtained, although the growing period has been increased up to 146 days. Transplanting on October 15th, the following results were obtained:

Marzanino with 96,200 kg/ha;

Piacenza with 94,700 kg/ha;

Ronita with 81,700 kg/ha.

Varieties recommended to farmers are Marmande and Ronita in the dry season. For the rainy season, Ronita also is recommended and Fournaise as an early variety.

The recommended density is 25,000 plants/ha (0.8 m x 0.5 m) with a total of 7,000 m³/ha of water for irrigation. The following water distribution is advisable:

After transplant: 5 weeks with 350 m³/ha;

At flowering until fruit settling: 7 weeks with 500 m³/ha;

Ripening-harvesting: 5 weeks with 350 m³/ha.

Sugar Cane

From a collection of 81 varieties, 5 have been selected with the best results, on industrial plots, with harvesting in November.

<u>Varieties</u>	<u>Tons Cane/ha</u>	<u>Brix %</u>
CO. 740	129	20
CO. 775	114	21
B. 43/62	99	23
NCO. 310	114	21
NCO. 376	112	20

The recommended fertilizers are:

Urea: 100 kg/ha;

Supertriplephosphate: 80 kg/ha;

Potassium Chloride: 150 kg/ha.

The sulfates present on Tillabery soils are believed to be sufficient for sugar cane development.

Comments on Niger Agricultural Research

Impressive progress has been made at the research experiment stations in Niger under IRAT auspices. The results obtained with the most important food crops: millet, sorghum, cowpeas, and peanuts, offer to the farmers great possibilities for substantial gains. In order to make available to the farmers the high yielding varieties obtained at the research stations, as well as the modern cultural practices tested, seed multiplication fields, seed cleaning equipment and a well organized extension service are necessary and should be provided as soon as possible.

Funds should be made available to support projects related to expanding research, installing laboratories (the first is under construction), increasing the research staff with expatriate specialists to train the Niger personnel, organizing seed multiplication fields under the strict supervision and control of the research stations, creating properly equipped seed cleaning units and delivering to farmers properly certified seeds. In order to transfer to the farmer the new cultural practices tested at the research stations, an efficient extension service is required. One of the most urgent tasks should be to help the Niger Government to organize this service. An appropriate administrative infrastructure is one of the most important requirements for agricultural development.

Given that Niger has water available in a limited capacity, its agricultural development should be planned in such a way that maximum production can be attained per unit of water used. Crops that require small water duties should be encouraged instead of those that require large amounts of water (rice) except in areas that flood under natural conditions. Excellent experimental results have been obtained with wheat varieties (6 tons/ha) using about 7000 m³/ha of irrigated water. Rice, with a similar yield requires 27,000 m³/ha of irrigated water. Four times more wheat than rice can be produced per unit of water available.

It is advisable that rice expansion should take place only in areas where only rice could be grown, due to the nature of the soil or the amount of water available (marshes, "bas-fonds").

Concerning vegetable crop expansion, the reported high yields of onions and tomatoes, if farmers properly organized under a marketing structure, could provide large benefits in some areas suitable for their future agricultural expansion. With these possibilities, processing industries should be considered: a dehydration plant for onions and a cannery plant for tomatoes are suggested.

It seems rather doubtful that soybeans can ever compete with the already well established peanut oilseed crops. The research efforts devoted to soybeans should be directed only to preserving a collection of varieties adapted to Niger's ecological conditions, which are rather marginal for soybeans. When large irrigation schemes are established in the future, soybeans can have a place in crop rotations.

APPENDIX I.C

HAUTE VOLTA: STATE OF AGRICULTURAL TECHNOLOGY

The failure of food grain production in Upper Volta to keep pace with the increase in population, even in normal years, reflects the lack of penetration of advances in research to the farmer's fields. There has been no significant adoption of improved variety and/or cultural practices, therefore no substantial increase in yield per ha has been obtained. A small expansion in cultivated areas has been observed in recent years, but the increase has been in cash crops: cotton, peanuts and sesame.

Research on food grains is done by IRAT. IRAT remains an alien organization, staffed with nine expatriate scientists. No efforts have been made to train the Voltaic personnel to take over the operation; the shortage of trained Voltaic personnel at the level of Ingenieur Agronome seems to be the major constraint.

Agricultural research in Upper Volta in the past appears to have been directed towards cash crops, particularly peanuts and cotton. This research has been done through two organizations: IRCT for cotton and IRHO for peanuts. IRAT has concentrated efforts in trials with local varieties of cereal grains and intends to do more research in the future on studies of inter-relationships of soil and plants, particularly as they concern rotation and intercropping.

The results obtained by IRAT on millet, sorghum and corn are encouraging. However due to the fact that IRAT is doing field tests under optimal conditions, these results have been hard to duplicate under normal farming conditions. As a consequence, at present there are no varieties of millet and sorghum available that could satisfy the normal agricultural practices at the farmer's level. This is not true for peanuts, corn and rice for which improved varieties can be used by the farmers.

IRAT has a close relationship with other international research institutions, like IITA (International Institute of Tropical Agriculture in Nigeria), CIMMYT (Centro Internacional de Multiplicacion de Maiz y Trigo in Mexico), ICRISAT (International Center of Tropical Agricultures in Hyderabad, India), IRRI (International Rice Research Institute in the Philippines), and others.

The level of technology utilized in trials to date is not related to application on traditional farms. There is a lack of government infrastructure to assess existing programs and to evaluate priorities.

The gap between research findings and their application to the farmer's operations will be addressed by a recently funded USAID Upper Volta seed multiplication project.

IRAT's work in Upper Volta dates from 1961 with three major stations: Sarya and Mogtado in the central region and Farako-Ba in the southwest. The underlying objectives of their work have been to develop seed varieties for cereal crops. These varieties have been selected for high yield potential, short growing cycles and to maintain soil fertility.

The Sarya station does varietal research in cotton (IRCT) and peanuts (IRNO). Thirty-five ha are used for research and 45 for seed multiplication. The average rainfall is 820 mm. The Mogtado research station has 15 ha, and its work is directed towards irrigation with its major activity research on sugar cane. The station at Farako-Ba has a total of 475 ha, 20 ha of which are devoted to research and 150 ha to multiplication of millet, sorghum and corn. The station also has a herd of cattle, Azaouak and Azaouak-N'Dana. The average rainfall is 1120 mm. IRAT also has several rural stations, primarily in valleys of the Volta river.

Another facility connected with research, is the Centre Agricole Polyvalent de Formation de Matourkou. This is a UNDP program initiated in 1963. Its major objectives were to train extension service agents and establish a pilot village to test the research-technological package and train model farmers, and also to begin a seed multiplication operation. In this operation 9 expatriate technicians were working with 60 Voltaic "fonctionnaires". The Matourkou Center is across the road from IRAT, Farako-Ba research station.

All variety testing is done by IRAT under identical doses of fertilization and technical practices. In cereal research, selection has been oriented towards reducing the size of the peanuts in order to reduce the straw-grain ratio. Also separate analysis has been made according to the type of soil.

For cereals, millets, sorghums, corn and in leguminous plants like cowpeas and peanuts, local varieties and collections from foreign countries are being tested. Crosses for hybrids, composites and dwarfs are being done.

No recent information was available concerning the experimental results on the material tested. As an index, the results included are from a 1971 report.

MILLET

The variety Penigare 1280 kg/ha with a low rainfall (665 mm.) in an area with a normal rainfall of 932 mm. Other varieties tested are: Dori, Zalla, Syn 71, G.A.M. (P2 Bilguez). The varieties Zalla and Synthetic 71 de Saria, are proposed for distribution to farmers. IRAT has selected several varieties adapted to different rainfall areas.

For the less than 700 mm isoyeth it is making extensive use of Souna III line from Senegal, although with poor results (500 kg/ha).

SORGHUM

The main varieties selected are: Sorgho 29, Tioadi, Quedezoure, Gnofing, 137-62, CE-90, Yi-Firi, 7706. Some long cycle F1 sorghum hybrid varieties from the Samaru station in Nigeria are yielding more than 4 tons/ha. Sorgho 29, the most widespread variety, perfected by IRAT from some local varieties, yields 2 tons/ha under good conditions. With poor conditions (1971) the long cycle, local varieties Gnofing gave 1383 kg/ha, Quedezoure gave 1359 kg/ha and Frikan gave 1813 kg/ha.

CORN

The varieties selected are: Jaun de Fo, yellow grain with 4,500 kg/ha and Massayoumba, white grain, with 5,000 kg/ha in lower rainfall areas. These varieties are purified from local Upper Volta strains perfected at Farako-ba station. Some first generation synthetic varieties taken from eight lines of local varieties promise higher yields beyond those of the improved local varieties. Other varieties with good yields are Western Yellow I and Samaru 123.

RICE

Varieties are selected for irrigated rice and "bas fonds". Where complete control of water is possible, long cycle varieties are proposed. The Gambiaika variety with a potential yield of 5-6 tons/ha has a long cycle (160-170 days), and long grain. Fossa variety, also with a long cycle prefers a saturated field rather than flooding. The potential yield is also 5-6 tons/ha. Other varieties, like Sossou and H-14 are being tested with promising results.

For "cuvettes" (river bottoms naturally flooded over a long period) the Gambiaika variety does well. For a shorter period of flooding -- with a cycle of 135 days -- the variety C.74 has given good results. It is highly resistant to diseases, responds well to moderate doses of fertilizers and adapts well to a wide range of conditions. For shorter periods of flooding Sintane Diofor (120 days cycle) and Dourado Precoce (105 days cycle) are most suitable. Other promising varieties are CICA-4 and IR-20.

Given that some soils (vertisols) have good water retention capacity it is possible to use short cycle varieties to be rainfed. Trials were run with some Brazilian varieties, like De Abril, Pralao Precoce, Batatais and the already mentioned Dourado Precoce, which gave the highest yield.

COMPEAS

The variety Bonbei 86-6) is worthwhile for field trials. A total of 88 varieties were tested.

PEANUTS

Several varieties with good yields have been tested and were selected for field trials. Those are: V-90, 28-206, TE-3, 1040, 55-437, 47-16 and Bonbei 55-437. Peanuts is not a prominent crop in this country.

DRAWF PIGEON PEA

One variety of this leguminous plant is ready for field trials: TUC-2705-3 from the International Institute for Tropical Agriculture.

CULTURAL PRACTICES

Maintenance of soil fertility has been one of the main subjects for IRAT's research in Upper Volta. The objective has been to maximize the yields for crops tested. Plowing tests at different depths (6-12-20 cms) with donkeys, oxen and tractors respectively, with fertilizers, has given in general significant results. Trials were run in different types of soils, with sorghum, cotton, crotaleris.

Rice was tested in hydromorphic soils under traditional farming conditions, donkey traction (12 cms deep), and tractor or oxen traction (20 cms deep). The highest results were obtained with tractors.

The results of all those tests are:

In deep "ferralitiques" soils and soils slightly "ferralitiques" the effect of plowing was nil with animal tractions (donkeys) and significant with tractor and oxen (30-40% increase over the standard). Plowing at the end of winter is advisable because it helps in water storage from early rains.

In hydromorphic soils plowing helps oxidation phenomena and better yields can be expected in rice.

Fertilizer tests were done with nitrogen and phosphates with sorghum, rice and corn. Economic results were obtained with small doses of nitrogen (30-40 kg of N/ha). In general the rainfall is the limiting factor for nitrogen response. With a normal rainfall, 16 kgs of sorghum grain were obtained per kg of nitrogen. With a limited rainfall only 10 kg of grain were obtained per kg of nitrogen. With corn in a normal rainfall year, 4,000 to 4,500 kg/ha were obtained with 150 kg of nitrogen/ha.

In crop rotating, sorghum following cotton and peanuts gave a significant response.

A linear response to nitrogen has been obtained for sorghum, with optional mixtures of phosphorus and potassium. Also corn has a linear response to nitrogen.

Several trials were run with fertilizers in various types of soils. Other tests were done with fertilizers and manure. The response was significant and linear. Also tests were done on sorghum with plowing under straw. Animal manure has been shown to be effective, not so much in the first year but in the second and third years.

Concerning the effects of fertilizers and manure, one of the most important observations was that high levels of mineral fertilizers lower the pH of soils (0.5 units in 4 years) while spreading manure can raise the pH in 0.6 units during a 4 year period.

According to IRAT's observation, crops can grow in the Sahel conditions at a pH close to 4, which is extremely low. In order to correct that low pH, liming would be advisable even if the results would only be shown in the long run.

A series of trials were done to test the effect of phosphorus and potassium on sorghum, corn, peanuts and cotton in different types of soils.

A strong handicap in the use of fertilizers in Upper Volta has been the transportation cost.

COMMENTS ON UPPER VOLTA RESEARCH

Comparing the research done in Upper Volta and Niger, it seems that there is a lack of coordination between the two IRAT stations. Several varieties already selected in Niger should do well in Upper Volta where, in some areas, similar ecological conditions do exist.

Economic studies should precede the use of fertilizers before advising the farmers to make use of them. The same can be mentioned for the introduction of new varieties. Where new technologies should be applied, the labor input would be different and the production cost affected. A thorough economic analysis of the costs involved in all these cultural innovations would certainly assure the farmer to accept the modern changes.

Since Upper Volta has a strong handicap in the high cost of imported fertilizers, due to the transportation factor, it would be most advisable to expand the use of green manure. IRAT has already done

successful trials with Stylosanthes gracilis. Other leguminous plants, like Centrosyna, well adapted to the Upper Volta conditions, could be very useful for trial purpose.

Liming the soils in order to correct lower pH should have top priority. Programs to study the economics of such operations, as well as local sources of limestone, should be included in future research programs.

Although selection of high yielding varieties is being done under optimal conditions at IRAT stations, this work is not realistic if the farmer cannot afford the use of fertilizers, in similar amounts as the station has been using. It is a well proven fact that most soils of the region are phosphorus deficient. Nitrogen fertilizers in most areas can be effective only if properly mixed with phosphate fertilizers. Due to the recent escalation of fertilizer prices, unless a full package of modern technology is applied, the small farmers will not be able to use them. Only animal manure, whenever available, or green manure could be applied in economical terms.

A revealing statistic generated by IRAT, from 10 years of observations including approximately 10,000 measurements is that the average effective daily work one can expect from an Upper Volta farmer is 4-5 hours per day. For any type of development program this figure should be considered. This would mean anywhere from a 17-38% reduction in daily work and would seriously alter the allocation of labor as well as the economics in any package program.

Undoubtedly in order to improve yields by the farmer, animal traction would be a necessity. More research in that line is necessary. IRAT has determined that in order to perform the necessary operations correctly the farmer needs 100 kg of traction power. Using the standard of 10 kg of live weight for 1 kg of traction power the farmer would need 1000 kg of weight or two 500 kg animals. The local cattle cannot reach that weight.

APPENDIX II

Page 43

SOCIOLOGICAL RESEARCH

I. Social Science Research Project

The Social Science Research Project is one of two elements under the Economic Development Research Organizations Project, the other being the African-American Scholars Council. Its goal is to assist African Countries to strengthen their capacity to conduct policy-oriented social science research by helping African universities with close linkages to the Government to develop their competence to carry out such studies. The intention is (a) to enable African countries to become less dependent on expatriate research talent for their development needs; and (b) to encourage African universities and research institutions to become more presponsive to development and national planning needs as well as to enrich their education programs through use of the results of local research.

The PROP for the project was approved in May 1973, at which time the first grant under the project was authorized in the amount of \$60,000 to the Univeristy Institute of Technology at the University of Dakar to initiate a program of studies requested by the Government of Senegal. In June, 1974, the second grant, to the Government of Kenya/University of Nairobi, was approved.

A third grant is presently under consideration to the Centre Ivoirien de Recherche Economique et Sociale (CIRES), a research institute associated with the Univeristy of Abidjan, Ivory Coast. The grant would finance five studies:

1. Integrated Development in the Center (Kossou Region)
2. Diffusion of Agricultural Technology
3. Economic Consequences of Drought in Guinean Sudan
4. Agricultural Marketing in the North
5. Integrated Development in the North

This type of research is highly relevant to the implementation of the Entente Food Production Project; funding through this grant could provide useful research in other Entente countries as well.

UNITED STATES GOVERNMENT

Memorandum

Appendix II
Page 44

TO : P. Lyman, AFR/DS
D. Shear, AFR/CWR

DATE: March 27, 1975

FROM : M. Wedeman, REDSO/WA

SUBJECT: Training of African Counterpart Sociologists

An increasing number of rural development projects in the CWR area entertain a strong sociological research and evaluation component. Mali Livestock sociological research is well underway, and sociology has been prominently involved with recent design efforts in Mali, Niger, Chad-Cameroun, and others. A sociological inquiry is proposed for the Selibaby, Mauritania, project, and a broad program of sociological development-related research is being directed to REDSO/WA staff.

Many, if not all, of these research programs provide for host country counterparts along with expatriate (US and TCN) researchers, yet it is extremely difficult to find adequately trained local persons. Almost all individuals who have had sufficient education to undertake these studies without constant supervision already occupy civil service and/or educational positions and are unable or unwilling to work in the bush.

The demands for a sociological research capacity will clearly increase over the next five to fifteen years, as the realization that an understanding of the human dimension of rural development is generally established. There will be openings for HCN personnel that will not be filled unless substantial efforts are made to close the gap between supply and demand.

We therefore propose the following program for training of development-sociologists:

1. Each project which will have an expatriate sociologist(s) should also provide for HCN sociologist(s). The two will work closely with each other, and will be under the same general scientific supervision. A senior scholar should be available to provide research direction as needed, to visit the field periodically, to read and criticize field reports, and to provide additional linkage to persons responsible for project implementation.
2. For three months each year all the HCN francophone sociologists should come together for a common seminar, staffed by senior scholars, who would provide intensive formal classroom study. During this period, the sociologists-in-information would have an opportunity to interact with peers from other countries and who are working on other projects. It would probably be useful for exchange field visits to be arranged, in which, for example, Malian sociologists working on a livestock project would visit Senegalese sociologists working on a grain project.



Training of African Counterpart Sociologists (cont.)

1. This nine months "on-the-job" and three months classroom and field visit program would repeat for the second year.

4. At the end of the two year period, some of the participants might be selected for advanced training overseas. All of the earlier training would be done in one of the CWR countries.

A mechanism for this activity might be to solicit an American university which would provide the overall director of training, the curriculum, and staffing of the in-country seminar, and the possible advanced training for the few persons identified by the director as capable of making senior-level contributions to the position of authority in which the training will be made relevant to the development plans of the country. A certain minimum number - perhaps six to eight - of HCN persons would be required for the seminars to justify the expense and effort, but as I read the intent of development projects, we should have no difficulty in meeting this number.

Drafted by :
MHorowitz, REDSO/WA

SOCIOLOGICAL RESEARCH in ENTENTE REGION ^{1/}

INSTITUTIONS

1. Institut de Recherche et d'Application de Methodes de Developpement, 49, rue de la Glaciere, Paris 13^{eme}. This institute has produced sociological research of a first-rate quality. The researchers which met with the design team had considerable experience living in the "bush," and were concerned with a whole spectrum of sociologically-relevant research, including role of women, effect of price policy on production and welfare, etc. IRAM could play a major role in assisting the local sociological research institutions in project-related research. (M. Belloncle met with the design team.)
2. Institut National de Development Economique et Social, (INADES) in Abidjan, Ivory Coast, has a library for rural development and publishes articles on rural development as well as a monthly newsletter for African farmers.
3. Pan-African Institute for Development (PAID), head-quartered in Geneva, Switzerland, but with an African office in Douala, Cameroun, has a French-speaking school for rural development personnel at mid-levels of government positions. The school, Ecoles des Cadres, operates a two-year course including lengthy stays in rural areas to identify development problems at a local level. The school has already trained numerous cadres from the Entente countries. A list of these people, as well as possibilities of enrollment, may be obtained from the school's director, M. Garcia. The AID mission in Yaounde, Cameroun, has the address.
4. PAID also has a center for management training which offers courses in project design, cost-benefit analysis, etc. Also located in Douala, Mr. Atangana is the director of this Center.
5. PAID's third and final component is the Centers of Applied Research located in Douala and Buea. Although at the present time the research is limited to the Camerouns, they may have insights pertinent to the Entente region.

INDIVIDUALS

1. Professor Michael Horowitz, Department of Anthropology, State University of New York (SUNY) at Binghamton, has recently completed a year at REDSO. He is familiar with social science research in the Entente region.
 2. Professor Steve Reyna, Department of Anthropology, University of New Hampshire, has contracted with AID for several research activities in francophone Africa. Design team discussions with him in Niamey in June 1975 centered on the need for training activities for sociological institutions in the Entente region. He could be of assistance both in substantive research, and training activities.
- ^{1/} See also Roster of African Consultants, REDSO/WA, May 1975, and up-dates by Howard Helman, AID, in Paris.

APPENDIX III. A.

GUARANTIES ACCORDED BY THE ENTENTE FUNDS
(in millions of CFA)

Year	Country	Purpose	Beneficiary	Amount of Guaranty	Total Investment	Outstanding Guaranties (as of 1/1/75)
1967	Upper Volta	Warehouse	Chamber of Commerce	90	90	0
1968	Dahomey	Kenaf I	Government	275	See Kenaf II	102.6
	Togo	Lomé Sanitation	Government	300	722	60
	Niger	Agricultural Equipment	Government	62	62	0
	Benin	Textile Factory	ICODA	150	450	150
1969	Upper Volta	Agricultural Equipment	Government	68	85.3	12.6
	Togo	Entente Houses	S.C.I.C.E.	110	292.5	0
1970	Upper Volta	Banfara Flour Mill	G.M.V.	125	410	122.8
	Togo	Clinker Crusher	CIMAC	135.2	425	67.8
	Upper Volta	Oil Processing Mill	S.H.S.H.V.	272	719	144.8
	Benin	Kenaf II	Government	675	3,083	171
1971	Upper Volta	Warehouse at Lomé (Togo)	Chamber of Commerce	65	60	65
1972	Upper Volta	Warehouse at Bolo-Dioulasso	Chamber of Commerce	70	60	70
1973	Upper Volta	Warehouse at Abidjan	Chamber of Commerce	40	62	40
	Niger	Entente House I	S.C.I.C.E.	180	180	180
	Upper Volta	Entente Livestock Bldg. and Villa	S.C.I.C.E.	115	115	110
	Benin	1 Villa	S.C.I.C.E.	25	25	25
	Niger	Hotel Ayorou	SOEENTE	40	100	40
1974	Niger	Entente House II	S.C.I.C.E.	180	180	180
TOTAL				2 967,2	7 134,6	2,066,4

APPENDIX III.B

MUTUAL AID AND LOAN GUARANTEE

FUND OF THE ENTENTE COUNCIL

Development Activities Financed by Donors

UNITED STATES - A.I.D.

1971

Livestock Sector Loan	\$	6,000,000
Livestock Technical Assistance		429,000
Regional Road Maintenance Training Center		898,000
Grain Storage Technical Assistance		630,000

1972

African Enterprises Study	\$	14,000
Grain Storage Loan		1,800,000
Regional Road Maintenance Training Center		950,000
Spare Parts Management Study		96,000

1973

African Enterprises Loan	\$	7,500,000
Regional Road Maintenance Training Center		746,000
African Enterprises-Training needs Study		10,000

1974

African Enterprises-Commercial Sector Study	\$	75,000
African Enterprises-Technical Assistance		350,000
Regional Road Maintenance Training Center		350,000
Livestock-Statistical Seminars		85,600

1975

Regional Road Maintenance Training Center	\$	1,858,000
African Enterprises Technical Assistance		370,000
African Enterprises Loan II		10,000,000
Grain Production and Marketing Technical Assistance		297,000

FRANCE - FAC and CAISSE CENTRALE

1972

Lome-Cotonou Telecommunications	F CFA	130.000.000
Market Gardening Study		42.200.500
Geological Study		23.000.000
Livestock Technical Assistance (3 advisers)	x x x	
Fisheries Study	x x x	
Cotonou Slaughterhouse Study		22.500.000
Grain Storage : One adviser and Equipment ..		43.870.000
Presidential Radio Network		150.000.000
Artisan Study	x x x	

1973

Freight Bureau Study	x x x	
African Enterprises Study (SATEC)	x x x	
Livestock Technical Assistance		36.250.000
Lome-Cotonou Telecommunications (Increase) .		50.000.000
Presidential Radio Network (Increase)		33.750.000

1974

Construction of Training Ship		50.000.000
Livestock-Ivory Coast Seed Farm		44.000.000
Livestock-Cotonou Slaughterhouse		54.500.000
Regional Road Maintenance Training Center ...		32.500.000

1975

Lamakara-Ouagadougou Telecommunications:

	FAC	450.000.000
	CAISSE CENTRALE LOAN	320.000.000
Pendjari Bridge Study		22.500.000
Upper Volta Mineral Plan		25.000.000
Togo-Benin Geological Program		47.500.000
Hotel Training Study		4.425.000
Tombao Port Facilities Study		35.000.000

CANADA - C. F. D. A.

APPENDIX IV

Page 50

Page 1 of 3 page

Subproject Proposals

The subprojects initially submitted to the Entente Fund had been prepared under great time pressure and with no guidelines as to the available amount of funding. A brief analysis of these subprojects is set out in the following paragraphs.

Upper Volta submitted a project for increasing the production of millet, sorghum, and corn. This increase in production would occur through improved cultivation practices on three hectare sedentarized plots, which would be increased to five hectare plots by the second year. Two-thirds of this area would be cultivated by sorghum, millet, and maize, with cotton, groundnuts and cowpeas grown on the remaining area. Crop rotation and the introduction of animal traction would contribute towards the maintenance of the fertility of the soil. The total number of farm systems to be installed were 6,000 in the Volta River Valley and 21,200 in the ORDs, benefiting a total population of 272,000 or ten persons per farm. The funding requested for the program included \$5.6 million to finance fertilizers and \$6.3 million to finance the purchase of farm implements. This request represents funding requirements for five years, with no provision for reflow calculations if the financing were to focus on agricultural credit. No provision was made for administrative costs or the training of extension agents.

While in principal the team agreed with both the purpose and the strategy of the proposal, it felt that the proposal was overly optimistic with respect to both coverage and expected output. Furthermore, the team made clear that AID would not finance subsidies. Therefore team discussions in Upper Volta centered on the provision of agricultural credit on reasonable terms to encourage the buying of farm implements on a small farmer basis through the Banque National de Developpement, which provides agricultural credit. The team also expressed interest in promoting the exploitation of Upper Volta's phosphate resources, which through a low-cost system of exploitation could provide cheap fertilizer for the badly depleted soils of small farmers in Upper Volta.

Niger submitted requests for two distinct subprojects. The farm mechanization project consisted of subsidies amounting to \$10 million over a five-year period coupled with another \$5 million to support production costs of the equipment and extension services. The team indicated that AID endorsed the concept of promoting the use of farm implements and animal traction, but that AID would provide credit on appropriate terms rather than subsidies. Furthermore, the cost of manufacturing the proposed Nigerien equipment was nearly double the cost of similar equipment in Upper Volta. Thus the team proposed that one or more small artisan-oriented workshops based on the Upper Volta ILO model be considered. This approach would require a lower initial investment (around \$80,000 per workshop, including working capital), and could produce cheaper equipment which small farmers could afford without

subsidy if medium term credit were provided. The Nigeriens appears to be interested in exploring this approach.

The second component of Niger's proposal consisted of a \$3 million project to develop small pump irrigation units in inlets along the Niger River which flood during the rainy season. These small irrigated perimeters of 20-40 hectares would be cultivated by small farmers. The cost would include land leveling, diking, and 10 horsepower pumps to assure the supply of water. The team concurred in the low-cost technology approach and the small farmer-oriented production promoted by the project. The team also proposed that a Field Trial Officer be provided to test rice varieties in these and other conditions (bas-fonds and cuvettes) characteristic of traditional rice farmers in Niger. This expert would work in close cooperation with WARDA, the West African Rice Development Association.

Ivory Coast requested three subprojects in support of maize production. The first project was to finance a seed multiplication center for hybrid and composite maize, including 300 hectares for hybrid and 100 hectares for composite maize. About one-third of the \$3.3 million project was to finance construction costs while the remainder was to finance operating expenses over a four year period. The team did not fully concur with the project on the following grounds:

- 1) The World Bank is already committed to financing a seed multiplication center for maize; thus the only possible AID input would be to provide irrigation equipment which was overlooked in the World Bank project.
- 2) Hybrid maize is very expensive to multiply, since plants must be crossed every year. Thus a large area is required for seed multiplication. Synthetic or composite maize, on the other hand, is cheaper because it requires a small area for multiplication and provides comparable yields in normal small farmer conditions.
- 3) Hybrid maizes require annual purchasing of new seeds, since yields diminish rapidly in second and third generations. Thus synthetic seeds, whose yields remain high, appear to be preferable since small farmers are not accustomed to buying seeds annually even if an adequate delivery system existed.

The second component of the Ivory Coast request was \$8 million for two 10,000 ton maize storage silos, five hangars for collection depots at Bondoukou, Bouake, Daloa, Bouagle and Korhogo. The storage silo facilities must be capable of cleaning, drying, aerating, and fumigating grain; removing dust; maintaining quality and loading out the grain. This is estimated to cost 65,000 FCFA (\$325) per ton plus 5,000 FCFA (\$25) per ton for storage, or 64¢/bushel compared to 10-15¢ in the U.S. The team pointed out that these costs were excessive, and that the risk of spoilage or infestation in large silos is high. The team indicated that AID would favor small grain storage units with driers similar to those in Dahomey. These units cost about \$30 per 2-ton storage unit and about \$100 per drying unit which can be shared by up to ten farmers, or about 3-4¢/busher if ten farmers share a drying unit.

The third component consisted of training nine research workers, (M.S. or Ph.D. level), 15 agronomic engineers and 13 technicians. Training in the U.S. is calculated at \$20,000 per year, although more recent estimates by Ivorian officials fall into the \$9,000 range. Further discussions with officials revealed that their training needs had been revised since the submission of the Entente Fund proposal to include approximately 18 masters degrees, including 4 at Cornell in maize breeding; 6 at Illinois in soy beans, 4 at Florida in animal sciences, and 4 at McGill in agricultural economics. Given the importance of developing appropriate technological packages at the small farm level, the team agreed that training would constitute an appropriate use of loan funds for the Ivory Coast. The subject matter of AID funded training will clearly be relevant to domestic food production needs. The countries of training have yet to be determined, but will likely be limited to Code 941 countries.

Togo's proposal consisted of a nation-wide program to expand maize, sorghum and millet production. The administrator/organizer of the \$24 million project would be the Ministry of Rural Economy; research would be provided by the Institute Polyvalent de Recherche de l'Economie Rurale; the five SORADS (Societe Regionale d'Actions de Developpement, similar to ORDs in Upper Volta) would provide extension services; the CNCA (Caisse National de Credit Agricole) would provide credit and financing; and storage and marketing would be the responsibility of Togograin. The actual funding for the project would be \$14 million to subsidize fertilizer at 15 FCFA per kilo; \$5 million for selected seeds; \$4.3 million for extension (\$8,500 per agent per year); \$10,000 for seed protection and \$750,000 for three foreign experts for five years. Clearly the proposal was beyond the scope of the present project. Team discussions with local officials indicated that Togo has no facilities for seed multiplication: this should certainly be one area for AID financing in Togo.

Benin's proposal consisted of a program to expand maize, sorghum and millet production in areas which are presently covered by cash crop extension programs in cotton and peanut growing areas. The \$15.3 million program would finance seeds, insecticides, dryer/storage operations, extension and marketing. The proposal was intended to cover major food production needs in Benin, for both domestic consumption and export. However, the team learned that the IBRD is in the process of negotiating an integrated rural development project which covers food production needs in about 80% of the country. Therefore, the team recommended a project in the Atacora region in northwest Benin, which is outside the IBRD project area and was cited in the CWR DAP as one of the poorest regions in Benin which should be considered for AID assistance. Team discussions with the Minister of Rural Development also indicated that rice development in the bas-fonds of Northern Benin including the Atacora region have become a major priority for the Beninese government.

A Small Farmer Development Strategy

Small farmer programs pose systems development problems of great complexity. Improvements in the productivity and income of small farmers typically require changes in a number of elements of the environment within which the small farmer operates including improvements in agricultural technology, input delivery systems, marketing, agricultural credit, rural savings, rural infrastructure, rural industry, base level organizations, training, the administrative framework which supports the development process, and the policy framework which defines the "rules of the game" from land tenure structure to price policy. A decisive lesson of development activities in the rural sector to date has been the recognition that "single function" projects which attempt to improve conditions of one of the numerous elements bearing on the small farmers' situation are unlikely to be effective. The small farmer faces a complex set of constraints. Substantial improvement along one dimension may relieve one binding constraint only to run into another constraint. Hence thinking in the rural development field has moved toward activities which promote systems as a whole rather than improvements in one or a few functional elements such as agriculture credit or agricultural technology in isolation.

The foregoing characteristics suggest that in the Entente states area, as in much of Africa, it will be necessary to develop a number of approaches to rural development suitable for "micro-conditions" which will vary from each other along a number of dimensions. In order to maintain the focus of the project in the face of the diversity of possible subproject activities, this section of the PP will explore some implications of the general problem outlined above and suggest an analytical framework to define the nature and direction of small farmer food production activities under the project.

An article by George Benneh of the University of Ghana at Legon entitled "Systems of Agriculture in Tropical Africa" 1/provides a useful typology upon which subsequent analysis may be based. Benneh points out that the distinction between shifting cultivation and the plantation system oversimplifies the nature of agriculture in tropical Africa and makes the implications of changes which are taking place as a result of cultivation of cash crops, agricultural innovations and policy. He presents a classification scheme which emphasizes the dynamic characteristics of the agricultural system "as a product of a continued appraisal by the farmer/decision maker of the biological and economic resources at his disposal and the decision taken in light of this on means and practices aimed at the achievement of agricultural production and at maintaining soil fertility." "

Each individual farm enterprise following the agricultural systems described in the Benneh typology is characterized by certain conditions in each of the

1 /Source:

various elements of farm operation and their relation to the outside world. Elements in this sense refers to technology, farmer organization, input delivery systems, marketing and storage, savings and credit, extension, the system by which the government manages the rural sector, and general government policy. The degree to which the potential of any agricultural system is achieved depends upon the state of development of these individual elements. It doubtless will often be the case that the most attractive development strategy to follow will be that of developing the potential of even relatively primitive agricultural systems. In other cases it will be deemed desirable to attempt to move small farmers from one agricultural system to another.

For purposes of simplifying the discussion, the conditions, or elements which provide the framework within which various agricultural systems will be grouped into three "phases".

Phase I: Traditional agriculture characterized by: traditional technology; traditional social organization of production units; limited dependence on outside economy for timely inputs; on-farm storage; limited marketing interchange village; minimal infrastructure; no credit; savings invested in livestock or other non-financial forms; minimal contact with government agencies; minimal influence of policy on farmer behavior.

Phase II: Transition toward modern cash crop cultivation characterized by: innovation in agricultural systems and seed varieties; initial stages of non-traditional farmer organization development (e.g. "pre-crops"); some roads and basic infrastructure; rising dependence on outside economy for credit, fertilizer, implements, seeds; group storage and marketing of some surplus; initiation of financial savings; extension).

Phase III: Modern small farm agriculture, usually based on cash crop characterized by: wide use of technology packages developed for small farmers and locally tested; broadly based farmer organizations providing important services and feedback link to government agencies; well developed infrastructure including roads, market facilities, irrigation, etc.; substantial dependence on timely flow of inputs from outside economy; locally controlled savings and credit facilities responsive to farmer needs; effective input delivery systems; effective marketing of substantial surpluses; effective government management of rural sector; government policy supportive of cash crop production and/or rural development.

This suggests that potential small farmer food production development activities under the project might be arrayed in the form of a matrix attached in the accompanying table. Thus small farmer food production projects must involve identifying and developing improvements in a number of discrete situations. These improvements may involve one or more of the following:

1. Improve the productivity of an existing agricultural system without changing the nature of the system fundamentally (e.g. by providing improved seeds to shifting cultivators) or

2. Changing the nature of an agricultural system (generally from fallow to permanent agriculture); or

3. Increasing the complexity of agricultural systems by adding new cultural practices to existing systems (e.g., by adding three crops or animal husbandry to an existing compound farming system.

4. "Single function" interventions directed at assuring availability of a particular input or support element in a given area when no other imbalances are created.

APPENDIX VI

Page 56

Page 1 of 4 pages

Constraints to Small Farmer Production

Owing to both climatic and technical reasons, the kinds of activities feasible for small farmer food production activities are rigidly constrained. What it is technically possible to produce is constrained by low fertility and the paucity of technical packages suitable for small farmers. "Technical packages" in this sense includes improved seed varieties, soil and water management practices and inputs at prices which permit profitability at acceptable risk levels. What will be produced (assuming rational farmer behavior) is constrained by limited access to inputs at reasonable prices, access to markets and by the effects of price policy which generally encourage cash crop production on all land not committed to food for family consumption.

Policies and programs which can be undertaken to improve the food production situation are constrained by a number of factors. The generally low population density tends to reduce the economic feasibility of a number of potentially important interventions such as access roads, farmer organization-based upon input delivery systems and marketing arrangements. The competence of government agencies to develop and implement operations is generally questionable and already overtaxed in some countries. Finally there are cultural constraints to adopting innovations in many potential small farmer project settings.

In summary, the situation cannot be characterized as one in which a few critical constraints can be identified which can be relieved by judicious investment and organization to permit a developmental surge. To the contrary, it appears that every element of the agricultural-rural sector situation presents serious obstacles to even modest development efforts. These problems include:

1. Low population densities are common which makes pro rate costs of infrastructure and services inherently high.

2. Soil fertility is low and rainfall is often low and erratic especially in the northern areas.

3. Historically investments in food crop production have been very low. Therefore farmers have generally benefitted from little exposure to modern methods. Many have no experience with animal traction.

4. Traditional production methods are deeply embedded in the social fabric of the farming community implying that changes in production methods require significant changes in many aspects of the life of the people; however, evidence shows that adoption of profitable technology with acceptable risk can be rapid.

5. Agricultural technology has not been developed with small farmer conditions in mind. Hence, a store of knowledge suitable for rapid adaptation by the traditional farmer is not available, although some innovations could be introduced.

6. The understanding of the farmer's life and problem is limited, making it difficult for the modern sector to extend effective help to the farmer.

7. Government policy making and operational machinery necessary to promote small farmer development are both weak and already heavily engaged in various development activities.

8. Infrastructure is generally poor.

9. The system of urban places in rural areas within which facilities to support rural development must be located is marginal and often non-existent as a practical matter.

10. While conditions of deep underdevelopment are widespread, the specific characteristics of that underdevelopment and the ecological and cultural conditions within the region are highly diverse. Thus, a myriad of individual problems must be identified, understood and addressed, often in isolation.

On the other hand, there are a number of resources available which can be called into the food production process with decisive effect given a well-defined development effort. Examples of these readily available resources include:

1. Water resources which can be exploited more effectively by means of wet soil management techniques such as improved bas-fonds, decrue and cuvette practices.

2. Intermediate technology could improve soil moisture conservation practices through the use of implements for scarifying, contouring and plowing.

3. Mineral and organic resources such as phosphate deposits and animal manure, which are locally available, could be applied.

4. Off-peak labor on second and multiple crops.

5. Knowledge and techniques of the best farmers which has not been gathered, understood and disseminated.

6. Use of technology of other countries in the region and world-wide research networks.

Page 3 of 4 pages

Added to the foregoing factors, there is an extraordinary climatic, ecological and cultural diversity in the rural areas of the Entente States. Thus general solutions and broadly applicable programs are unlikely to emerge. It is apparent that a number of agricultural systems must be evolved in order that small farm agriculture becomes more efficient generally.

In this connection, it should be noted that an "agro-cultural system" has a number of dimensions all of which must function together in some kind of dynamic equilibrium. Among these dimensions are:

1. Soil fertility maintenance systems
2. Water management systems
3. Food Crop technology
4. Land tenure systems
5. Inputs delivery systems
6. Marketing systems
7. Rural financial systems
8. Rural organization
9. National policy framework
10. Cultural setting of the operation.

Changing an "agro-cultural" system cannot typically be effected by an intervention along one or two dimensions because other dimensions may not necessarily adjust. For example, a significant improvement in yields caused by a new seed variety may not improve the performance of the agro-cultural system into which it is introduced: The surplus yield may not be marketable, the inputs may expose the farmer to excessive risks, or the cultural norms of the area may dictate a reduction of acreage or a distribution of the higher income flow thus discouraging extra efforts required of the farmer.

Thus it follows that for an intervention to be beneficial to small farmers, it is extremely important that operations in the field directly impacting upon small farmers be designed and managed in a way that all the factors or dimensions be at least taken into account if not directly addressed or controlled. For example, an irrigation project for small farmers cannot assume the effective functioning of the extension service in providing proper seeds although it must be recognized that this function is essential to the viability of the project. This does not mean, however, that all small farmer development activities must be "Integrated Rural Development" programs.

To the contrary, building the technological, institutional or infrastructure base for rural development may well be so important to future activity that relatively larger investments should be made in such areas than in small farmer field operations as such. In this sense, developing agricultural technology or government rural sector capabilities may be the "leading edge" of a longer term program of small farmer development.

Such may be the case in this project. The full elaboration in the Entente States of food production and rural development strategies which will use

all the available resources efficiently and thus maximize the productivity of the rural sector must be the work of decades. However, there appear to be certain prerequisites to broad scale small farmer food crop production improvement which should be pursued in conjunction with specific subprojects. Important contributions can be made under this project to two "leading edge" areas:

1. Development of suitable agricultural technology for small farmer productivity improvement (including improved seed, soil and water management systems and agricultural technology manpower development) and
2. Development of the capability of governments to identify, design, implement and evaluate small farmer production projects (including development of rural development manpower, analytical and management systems and capabilities to use applied behavioral sciences in rural development operations.