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The World Bank**

**Report No: 19420 MAU**

**PROJECT APPRAISAL DOCUMENT**

**ON A**

**PROPOSED CREDIT**

**IN THE AMOUNT OF SDR 28.2 MILLION (US\$ 38.1 MILLION EQUIVALENT)**

**TO THE**

**ISLAMIC REPUBLIC OF MAURITANIA**

**FOR THE**

**INTEGRATED DEVELOPMENT PROJECT FOR IRRIGATED AGRICULTURE**

**IN SUPPORT OF THE FIRST PHASE OF THE**

**INTEGRATED DEVELOPMENT PROGRAM FOR IRRIGATED AGRICULTURE**

**June 14, 1999**

**Rural Development 3  
Country Department 15  
Africa Region**

**CURRENCY EQUIVALENTS**  
(Exchange Rate Effective February 1999)

Currency Unit = Mauritanian Ouguiyas  
UM = US\$0.005  
US\$1 = 205 UM

**FISCAL YEAR**  
January 1 – December 31

**ABBREVIATIONS AND ACRONYMS**

AFVP	French Voluntary Association ( <i>Association française des volontaires du progrès</i> )
AGSECAL	Agricultural Sector Adjustment Loan ( <i>PASA-Projets d'ajustement et d'investissement du secteur agricole</i> )
APL	Adaptable Program Lending
ASP	Agricultural Services Project
CAS	Country Assistance Strategy
CIMOS	Interministerial Steering Committee for IDPIAM ( <i>Comité interministériel d'orientation et de suivi du PDIAM</i> )
CIRAD	Center for International Cooperation in Agricultural Research and Development ( <i>Centre de coopération internationale en recherche agronomique pour le développement</i> )
CNRADA	National Center for Agronomic Research and Agricultural Development ( <i>Centre national de recherche agronomique et de développement agricole</i> )
CU-IDPIAM	Coordination Unit for IDPIAM
DEAR	Environment and Rural Equipment Directorate ( <i>Direction de l'environnement et de l'aménagement rural</i> )
DPD	Detailed project design
DPSE	Policy and Monitoring/Evaluation Directorate ( <i>Direction des politiques et du suivi-évaluation</i> )
DRAP	Directorate for Agro-pastoral Resources ( <i>Direction de ressources agro-pastorales</i> )
DRFV	Research, Training and Extension Directorate ( <i>Direction de la recherche, de la formation et de la vulgarisation</i> )
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
FNT	National Transport Federation ( <i>Fédération nationale des transports</i> )
GDP	Gross Domestic Product
GIE	Economic Interest Group ( <i>Groupe d'intérêt économique</i> )
IDA	International Development Association
IDPIAM	Integrated Development Program / Project for Irrigated Agriculture in Mauritania
IFAD	International Fund for Agricultural Development
M&E	Monitoring and Evaluation
MDRE	Ministry of Rural Development and Environment ( <i>Ministère du développement rural et de l'environnement</i> )
NGO	Non-Governmental Organization
NPV	Net Present Value
OMVS	Senegal River Valley Development Agency ( <i>Organisation de mise en valeur du fleuve Sénégal</i> )
ONS	National Office of Statistic ( <i>Office national de la statistique</i> )
OSP	Socioprofessional Organization ( <i>Organisation socioprofessionnelle</i> )
RDS	Rural Development Strategy
SONADER	National Agency for Rural Development ( <i>Société nationale pour le développement rural</i> )
SONIMEX	National Agency for Import/Export ( <i>Société nationale d'import-export</i> )
UM	Mauritanian Monetary Unit (Ouguiya)
UNCACEM	Union of agricultural savings and loan cooperatives ( <i>Union nationale des coopératives agricoles de crédit et d'épargne de Mauritanie</i> )

Vice President:	Jean-Louis Sarbib
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Sector Manager:	Jean-Paul Chausse
Team Leader:	Abdelkrim Oka

**Mauritania**  
**Integrated Development Project for Irrigated Agriculture**

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Maps IBRD 30312  
IBRD 30313

**Mauritania**  
**Integrated Development Project for Irrigated Agriculture**

**Project Appraisal Document**

Africa Region  
Country Department 15

Date: June 14, 1999	Team Leader: Abdelkrim Oka
Country Manager/Director: Hasan Tuluy	Sector Manager/Director: Jean-Paul Chausse
Project ID: MR-PA-44711	Sector: Agriculture
Lending Instrument: Adaptable Program Lending (APL)	Themes: Poverty Targeted Intervention
	Targeted Interventions of the Project: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Program Financing Data (US\$m)					
	Total Cost	Beneficiaries	Government	Cofinanciers	IDA
Phase I: 2000 - 2002 (3 years)	46.0	3.7	3.7	0.5	38.1
Phase II: 2003 - 2006 (4 years)	45.0	5.0	5.0	-	35.0
Phase III: 2007 - 2010 (4 years)	45.0	5.0	5.0	6.1	28.9
<b>Entire Program (11 years)</b>	<b>136.0</b>	<b>13.7</b>	<b>13.7</b>	<b>6.6</b>	<b>102.0</b>

**Project financing data:**  
 Loan       Credit       Guarantee       Other [Specify]

**For Loans/Credits/Others :**  
 Amount (US\$ m/SDR m): US\$ 38.1 million

Proposed terms:       Multicurrency       Single currency:  
                                   Standard variable       Fixed       LIBOR-based

Grace period (years):      10  
 Years to maturity:      40  
 Commitment fee:      0.5 %  
 Service charge:      0.75 %

**Phase I Financing Plan (US\$m)**

Contribution of the Mauritanian Government	3.7	-	3.7
Contribution of Mauritanian Beneficiaries	3.7	-	3.7
Cofinanciers	0.5	-	0.5
IDA	15.2	22.9	38.1
<b>Total</b>	<b>23.1</b>	<b>22.9</b>	<b>46.0</b>

**Borrower:** Government of the Islamic Republic of Mauritania (GIRM)  
**Guarantor:**  
**Responsible agencies:** MDRE (UC-IDPIAM), SONADER, UNCACEM

Estimated Disbursements (US\$m)							
	1999	2000	2001	2002	2003	2004	2005
Annuals	10	12	14	2.1			
Cumulative	10	22	36	38.1			

Phase I implementation period: 3 years  
 Expected effectiveness date: September 01, 1999      Closing date for Phase I: December 31, 2002

## **A. Program Purpose and Development Objective of Phase I**

1. Mauritania's long-term vision is the Senegal River Valley turned into one of the main sources of its development and economic growth. By using as effectively as possible its limited and vital arable land and water resources and the electric energy from the Manantali dam – from 2002 onward – Mauritania will be able to create a dynamic and competitive agricultural sector able to supply the domestic market and find a niche in the international market. The Senegal River Valley, which already is home to 50 percent of Mauritania's rural population, will be the first to benefit, but the positive impact of this development will go beyond the Valley, since it will affect consumers throughout the country. This vision involves also the long-term development of a land market that will encourage greater productivity of land resources and the sustainability of investments, without resulting in insecure land tenure for poor and vulnerable groups. The vision includes the improvement in the standard of living and a reduction in the number of people living below the poverty line.

2. This vision of the Government is reflected in its overall strategy, specifically to achieve rapid economic and social development led by the private sector, with a State whose role will be to create the basic conditions needed to promote broad-based growth and to contribute actively to poverty alleviation efforts.

3. In the medium term, Mauritania envisions most of the existing irrigated schemes currently under production being rehabilitated – to the extent economically feasible – and entering into a sustainable production mode that would integrate intensive rice production and other agricultural activities (diversification, silviculture, livestock, and fisheries). The first priority for Mauritania is to rehabilitate degraded irrigation schemes still under production, and to expand collective schemes in which family parcels are too small to be economically viable or even to cover the family's subsistence needs. Reclaiming abandoned irrigation schemes and developing new ones will be a secondary priority since it is more costly, unless these schemes are for diversification, i.e., for crops with much higher added value than rice. In any case, these priorities are only indicative, since the decision to proceed with rehabilitation, extension or development of new schemes, as well as the choice of crops, rests ultimately with farmers themselves, in consultation with the financing agencies eventually supporting them. These choices and decisions will undoubtedly be based on economic and financial criteria.<sup>1</sup>

### ***A1. Program Purpose and Phasing***

4. The development objective of the Integrated Development Program for Irrigated Agriculture in Mauritania (IDPIAM) is to increase agriculture value-added, income and employment population living in the Senegal River Valley. This will be accomplished through the judicious use of the most precious natural assets in this country, which is 90 percent desert: the Valley's water and arable land. The Program will also have an impact beyond the Valley itself: (a) by generating employment and income upstream and downstream of production (input supply, creation and maintenance of infrastructures, equipment repair and maintenance, processing, transportation and marketing of produce and exports); (b) by providing consumers with new agricultural products (fruits, vegetables, oil seeds, etc.) from the Valley to replace hitherto costly imported products; and (c) by improving the balance of trade through a reduction

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<sup>1</sup> Given that new irrigation schemes are likely to be too costly and not economically viable, except in the case of diversification crops and high-value export crops, it is likely that most farmers will opt for rehabilitation. Farmers would not borrow money to carry out a non-viable operation, knowing they would be unable to repay the loan and thus running the risk of being sued for non-repayment of debts and perhaps losing their land and other assets. Requests for new irrigated schemes will therefore be carefully scrutinized by the credit agency, which will not wish to incur great risks. The possibility exists for the development of new schemes for collective poor farmers through funding by other donors. To avoid distortions, such creations must follow the general principles of the global PDIAM: demonstrated economic return, beneficiary's participation, long-term credit, and targeted matching grant (for poverty alleviation purposes). The level of grants which should be calculated on the basis on projected cash flow of expected farm revenues and be judged acceptable by IDA.

in agricultural imports and the development of exports. In addition, through the creation of rural employment and incomes, the IDPIAM will reduce rural migration toward urban centers and eliminate the unemployment and social problems it causes. This program will thus help to alleviate poverty.

5. The IDPIAM program's total duration will be eleven years. IDA plans to support it through a three-phase Adaptable Program Lending (APL): a first phase of three years followed by two phases of four years each.

## ***A2. Program Description***

6. The overall program (IDPIAM) aims for the rehabilitation of nearly 20,000 ha and is expected to be supported by several donors. The part financed by IDA (the IDPIAM-IDA or Program) will be the central component of this overall program and will, over a period of eleven years, contribute to the rehabilitation or extension of 11,000 ha of existing irrigation schemes and the development of 2,000 ha of new irrigated schemes, the latter intended for diversification crops. Other donors are expected to help for the rehabilitation of an additional area of 10,000 ha during the same period.

7. During its eleven years of implementation, the proposed IDPIAM-IDA will allow the Government to: (a) establish appropriate economic, legal and institutional policies; (b) provide basic public infrastructures; and (c) supply the support services necessary for the development of a flourishing private sector-driven agriculture sector in the Senegal River Valley. The Program will also help farmers obtain the necessary financial resources to fund investments designed on sound economic grounds. It will address, at the same time, the environmental issues created by irrigation infrastructure and other works. Its impact will therefore go beyond the objective of rehabilitation/extension/creation of 13,000 ha irrigated schemes, in that it will also help strengthen the economic, legal and institutional framework indispensable for the Program's socio-economic, and financial sustainability.

8. The IDPIAM-IDA includes public funds for (a) public goods and services (important infrastructures, agricultural extension, market development, social services, and environmental impact mitigation); (b) the establishment of lines of credit (loans for equipment, production and marketing); and (c) subsidies (matching grants) to support private investment in irrigated land improvement, crop production and marketing.

## ***A3. Key Program Performance Indicators***

9. For the target area, the key indicators for the IDPIAM-IDA will be:

- a) overall agricultural growth: increase in total value-added of agricultural production (average 7 percent per annum);
- b) agricultural diversification: increase in the value-added of non-rice crops (average 10 percent per annum);
- c) productivity: land and labor productivity increase;
- d) economic return: improved competitiveness of the main crops;
- e) poverty alleviation: reduction in the percentage of people below the poverty line in the targeted area (from 60 to 20 percent) by the end of the Program;
- f) enhanced food security: increased incomes and reduction of the gap between food demand and domestic food production;
- g) access to land, water, services and credit by the poor, and
- h) environmental sustainability: reducing water logging, salinity and waterborne diseases.

10. Indicators are also defined for each phase's objectives. Some will be used as triggers between phases.

**A4. Phase I Development Objective and Key Performance Indicators**  
(see Annex 1)

11. The objective of the first phase (the Project) of the IDPIAM-IDA is to lay the foundations for a sustainable development of irrigated agriculture in technical, financial, environmental and socio-economic terms.

12. The first phase (the Project) will consist of the following components: (i) creation of an enabling policy, legal, and institutional framework; (ii) development of basic public and private infrastructure; (iii) improvement of farmers and farmer associations' management and organization skills; (iv) strengthening of the traditional irrigated agriculture subsector; (v) promotion of agricultural diversification; (vi) implementation of measures to mitigate project adverse environmental impacts; and (vii) Project management and monitoring & evaluation.

13. Phase I (the Project) is expected to provide the necessary incentives for the rehabilitation and extension of existing irrigated schemes over an area of about 3,000 ha and for the development of new schemes over an area of about 100 ha.<sup>2</sup> Some of the Project's components (support to farm organization and management; support to traditional crops; support to diversification; environmental mitigation) will have a positive impact on an area well beyond the 3,100 ha targeted in this first phase, since they will also be beneficial to schemes that will be rehabilitated by other donors, in addition to the IDPIAM-IDA. This aspect is important when attempting to estimate the cost of the Project per hectare as the Project total costs cannot be attributed to the only 3,100 hectares targeted for rehabilitation, extension or creation.

14. The key indicators for the first phase will be:

- continued absence of rice sector distortions, as a result of measures introduced in 1999;
- implementation of regulations associated with Decree 98/48 on transport sector liberalization;
- satisfactory rate of repayment (at least 95 percent) of loans granted by the agricultural credit agency (UNCACEM);
- operational and financial self-sufficiency achieved by UNCACEM by 2001;
- satisfactory level of eligible and fulfilled credit requests (at least 75 percent of irrigated scheme development targets);
- establishment of transparent and accessible land registries allowing verification of land use permits and temporary and permanent concessions;
- transparency, equity and security of land tenure judged satisfactory, as determined by results of participatory surveys;
- satisfactory access of poor farm families to agricultural services, as determined by the of participatory surveys;
- economic return on Government-supported investments in irrigated schemes demonstrated satisfactorily on the basis of initially available results;
- improved cost-benefit ratios for rice and new diversification crops on the basis of initial available results;

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<sup>2</sup> These rehabilitation and new developments will be carried out in areas where the basic rural infrastructure (roads, drainage and main canals) already exists and will be confirmed by the feasibility studies submitted to UNCACEM for the obtention of credit.

- establishment of procedures for collecting water charges and fees for management and maintenance of public infrastructure works;
- completion of feasibility studies, including EIAs, for off-farm infrastructures (crucial for investments planned under Phase II).

#### ***A5. Phase II Development Objective and Key Performance Indicators***

15. The objective of the second phase of the Program is to consolidate Phase I achievements and continue providing incentives and support to producers for increasing the area of rehabilitated schemes and the new creations. Phase II will have the same main components as Phase I (see paragraph 12).

16. It is expected that, upon completion of the second phase: (a) the number and volume of new and higher value-added crops will increase; (b) investments made in Phase I will have become physically and economically sustainable; (c) income-generating activities will have significantly increased in the target areas; and (d) capacity building will have been accomplished. It is also expected that, based on the experience and results acquired under Phase I, an additional 4,000 ha of rehabilitation and/or extension will be carried out, and 700 ha of new irrigated schemes for diversification will be developed.

17. The key indicators for the second phase will be (see Annex 1):

- satisfactory access of poor families to land and agricultural services, as determined by results of participatory surveys;
- satisfactory repayment rate (continues to be at least 95 percent) on loans granted by UNCACEM ;
- amount and collection of water fees and collective infrastructure charges judged adequate for maintenance of those infrastructures;
- satisfactory management of collective infrastructures, based on technical assessments;
- awards of land-use permits, temporary concessions, and permanent concessions, are in accordance with land tenure legislation;
- satisfactory rate of rehabilitation/extension/new development (over 75 percent of targeted areas);
- economic return on Government-supported diversification efforts demonstrated satisfactorily on the basis of initially available results; and
- emergence and increase of new, non-farm activities (in number of activities and jobs, and in income-generation).

#### ***A6. Phase III Development Objective and Key Performance Indicators***

18. The objective of the third phase of the Program will be to achieve the sustainability of the scheme rehabilitation and development of production systems introduced under the two preceding phases and apply the Program approach to other schemes in the Valley. This objective would be attained through interventions similar to those of Phases I and II, namely: (i) providing farmers with the necessary technical assistance and credit; (ii) directly funding off-farm public infrastructures; (iii) supporting a program of R & D; and (iv) monitoring, analyzing and regularly adjusting the sector's economic policy, legal and institutional framework. Depending on the results of the first two phases, the level and form of credit and matching grants will be modified. The third phase is an expansion phase during which an additional 4,000 ha of irrigated schemes will be rehabilitated and 1,200 ha of new schemes will be developed.

19. The key performance indicators at the end of this third phase will be:
- overall agricultural growth: increase in total value-added of agricultural production (at least seven percent per annum);
  - agricultural diversification: increase in value-added of non-rice crops (averaging 10 percent per annum);
  - increased productivity: increased productivity of land and labor;
  - economic return: increased competitiveness of main crops;
  - poverty alleviation: reduction in percentage of the population living below poverty threshold in the target area (from 60 to 20 percent) by the end of the Program;
  - environment: reduction in water logging, salinity and waterborne diseases;
  - improved food security: increased incomes and reduction of disparity between consumption and domestic production;
  - access of poor populations to land, water, services and credit; and
  - UNCACEM reimburses IDA line of credit extended by Government in accordance with conditions of credit agreement.

***A7. Triggers to Move from Phase I to Phase II***

20. Triggers for moving from Phase I to Phase II will be that:
- liberalization measures for agricultural markets and transport services, as agreed upon between the Government and IDA in the 1999-2002 PFP, remain in place;
  - UNCACEM has achieved operational and financial self-sufficiency by 2001;
  - credit and investment subsidies granted in accordance with procedures agreed upon with IDA;
  - awards of land use permits, temporary and permanent concessions are in conformity with land tenure regulations;
  - establishment of transparent and accessible land registries allowing verification of permits and temporary or permanent concessions;
  - procedures are established for the collection of water fees and operation and management charges for public infrastructure works;
  - economic return on Government-supported irrigation infrastructures demonstrated satisfactorily; and
  - performance of SONADER judged satisfactory according to criteria set out in the performance contract.
21. The triggers for moving from Phase II to Phase III will be that:
- the favorable economic, legal and institutional environment created during Phase I is maintained and improved;
  - UNCACEM's financial self-sufficiency is maintained;
  - UNCACEM reimburses the IDA credit line extended by the Government;
  - credit and investments subsidies are awarded in accordance with procedures agreed upon with IDA;
  - awards of land use permits, temporary and permanent concessions continue to be in conformity with land tenure regulations;
  - transparent and accessible land registries are maintained and are used for the verification of land-use permits, temporary concessions and permanent concessions;
  - adequate water fees and collective infrastructure charges are; and

- economic return on Government-supported diversification activities is demonstrated satisfactorily on the basis of available results.

## **B. Strategic Context**

22. Over half (51 percent) of the 2.3 million Mauritians (1995) live in rural areas, which remain underprivileged in comparison to the cities. In the rural areas, 50 percent of children go to primary school (whereas primary school enrollment approaches 100 percent in urban areas); one out of five women can read and write (one out of three in urban areas); and, on the nutritional front, one in three children under the age of five is malnourished.

23. Nearly half of the rural population resides in the Senegal River Valley. Traditional economic activities in the Valley include livestock, rainfed and flood recession agriculture, and fishing in the Senegal River and its tributaries. A modern irrigated agriculture has emerged over the last twenty years and has expanded with the construction of two dams on the Senegal River: Manantali upstream and Diama downstream. Although the Valley fares better than other rural areas of the country, over half of its population is living below the poverty threshold.

24. Over the last twenty years, the concern of the Government and its development partners has been to: (a) improve the living conditions of poor and destitute population particularly those living in the Valley; and (b) promote the emergence of a modern, competitive agricultural sector by encouraging private initiative and investment. This concern has resulted in the creation and equipment, by: (a) public services, of village or community irrigated schemes in which each family is granted a plot of about 0.5 ha parcel; and (b) private sector, of individual schemes varying in size from a few hectares to several hundred hectares. Because the Valley continues to attract destitute population from drought-stricken areas, poverty alleviation in the Valley will remain one of the Government's top priorities. In different ways, these two types of farming help reduce poverty.

### ***B1. Sector-related Country Assistance Strategy (CAS) Goal Supported by the Program*** (See Annex 1):

CAS document number: 16595

Date of latest CAS discussion: May 21, 1997

25. The overall CAS goal is to help Mauritania achieve rapid, equitable and sustainable growth, create employment and thereby reduce the number of Mauritians living in poverty. In particular, the CAS supports the Government's long-term strategy for the rehabilitation and sustainable development of irrigated agriculture and the construction of basic rural infrastructures in the Senegal River Valley. The key element in this strategy is the overall Integrated Development Program for Irrigated Agriculture which covers the whole Valley and will call on the assistance of all donors. The part to be financed by IDA program, here the IDPIAM-IDA or the Program, will constitute the masterpiece of this overall program. IDPIAM-IDA therefore conforms to CAS objectives.

## ***B2. Main Sector Issues and Government Strategy***

### **Sector Facts and Issues**

#### Sources of rural sector growth

26. On the demand side, strong internal demand for agricultural products can be expected based on the rapid population growth (2.8 percent), anticipated GDP growth of five to six percent per annum, low inflation (four percent), and significant income elasticity for numerous highly preferred foodstuffs – such as meat, fruits and vegetables and high-quality rice. Between 1988 and 1996, per capita domestic demand for rice grew at an annual average rate of 5.4 percent (according to data from the *Office National de la Statistique* -ONS-), and at 5.2 percent according to the consumption budget (*consommation apparente*). Thus, rice consumption is running ahead of average population growth and is just slightly behind urban population growth (5.6 percent). Annual consumption of vegetables is estimated at about 60 kg per capita in Nouakchott and about 20 kg per capita in rural areas. As a result of rapid settling and growing urbanization, dietary habits are shifting towards increased consumption of fruits and vegetables (tomatoes, cabbage, carrots, potatoes, bananas, melon, okra, etc.). At present, production in the Valley, estimated at 30,000 tons, satisfies only a part of the demand due to the strong seasonal pattern of production (January through April).

27. As for regional and international demand, the outlook is good for horticultural products where there is a potential for developing profitable exports (off-season European markets). Experiments in the exportation of okra and green beans and recent tests on melon have been promising as local and European markets responded positively.

28. On the **supply** side, Mauritania has the potential to fill domestic demands and a portion of the international demand. It has considerable surplus production in livestock but, given the country's desert climate, it is in irrigated agriculture that the potential sources of growth remain important. Mauritania can achieve a comparative advantage in fruit and vegetable production and, possibly, in high-quality rice, if crop diversification, improvement and intensification are introduced. In this area, Mauritania also possesses an important asset: the existence of dynamic entrepreneurs willing to invest in agriculture and highly adept at business.

29. In addition to food crops, livestock and fuelwood constitute an important resource, in terms of supply and demand, in the rural economy. Livestock supply is very important and there is an important regional demand for livestock on the hoof and fresh/frozen red meats and international demand on skins and hides. As for fuelwood, estimates indicate that consumption of is eight times higher than the estimated annual volume increment of natural forest, which means that there is strong and rapid erosion of productive capital. There is also an important demand for other wood products that cannot be satisfied locally from the natural forests but for which man made plantations could be an opportunity.

#### The irrigated sector in Mauritania and its problems

30. With the exception of a very limited area (250 ha) in the oases, Mauritania's irrigation potential lies entirely within the Senegal River Valley for a total area of 135,000 ha.<sup>3</sup> This figure does not include the natural and man-made flood zones where controlled flood recession agriculture is taking place. Flood-

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<sup>3</sup> OMVS authorities initially estimated that available water could irrigate a total of 375,000 ha along the Senegal River Valley, of which 135,000 ha are in Mauritania. Experts now believe that these figures need to be revised downward.

recession agriculture is, strictly speaking, not considered to be irrigated agriculture<sup>4</sup> in the framework of this document.

31. A typology of irrigated schemes may be distinguished based on their size (small, medium or large) and their mode of management (collective or individual). The collective schemes are the oldest type. They received important public support until 1990/91, at which time the State disengaged itself from several production and processing-related activities. The development of large collective schemes is currently assisted to a great extent by SONADER, which has disengaged from that of smaller collective schemes. Up to now, the irrigated schemes have covered a total area of about 47,000 ha under full water control, of which only less than 20,000 ha are currently under cultivation.

32. According to SONADER's 1994 survey, the regional distribution of schemes showed that 71 percent of the area was concentrated in Trarza and the rest in the Haut Fleuve (18.5 percent in Gorgol and 10.5 percent in Brakna). Gorgol, however, had 63.3 percent of the large collective schemes (as against 27.2 percent in Trarza and 9.5 percent in Brakna). A survey carried out in 1998 in connection with preparation of the IDPIAM shows that, in terms of numbers, 66 percent of the schemes owned by individuals are under 40 ha and represent, in terms of acreage 26 percent of the total area individual-owned farms. In other words, one third of the individuals are cultivating nearly three-quarters of the area belonging to this category.

33. Mauritania's rural sector faces numerous constraints: (a) exclusive focus on rice, a sector in which performance remains low; (b) limited agriculture credit resources; (c) inadequate road and transportation infrastructure; (d) low level of expertise on the part of producers; (e) weakness of institutions charged with supporting rural activities; (f) environment problems associated with irrigation water; (g) abandonment of irrigation schemes; and (h) slow pace of implementation of land tenure securement process.

34. Exclusive focus on rice production, and mediocre results obtained. Until recently, public investment in irrigated lands favored rice. In addition, this crop enjoyed high protective tariffs (48 percent in 1998, 45 percent in 1999), seasonal credit at an advantageous below market rate (12 percent), quotas setting for rice imports in exchange of paddy purchases, and marketing subsidies (Table 1). Over the period between 1986/87 and 1996/97, the area planted with rice each year varied from 6,600 ha to 19,758 ha. Annual production ranged from 33,000 to 66,748 tons between these same periods. Average yield was 3,785 tons/ha, with a minimum average of 2,813 t/ha in 1991/92 and a maximum average of 5 ton/ha in 1986/87 (cropping intensity limited less than 1.0 on average). Despite this support, local rice has trouble asserting itself vis-a-vis imported rice, in terms of price and quality. It only maintains its footing in relation to imported rice thanks to high tariffs and importers' obligation to buy local rice first. These measures do not really benefit farmers, except over the very short term. They are detrimental to consumers, especially poor consumers, for whom rice is a staple food for which they must pay high prices and tolerate inferior quality. Thus, despite a noted increase in production, results do not meet the goals of broad-based, sustainable growth and poverty alleviation. From the standpoint of resource allocation, producers also have no incentive to try other crops in which Mauritania could prove to have a competitive advantage.

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<sup>4</sup> Natural flood zones are found along the Senegal River and its tributaries and are used for flood recession agriculture involving an area ranging from 150,000 ha in years of good rainfall to 50,000 ha in dry years (during the worst drought years, the figure dropped as low as 12,000 ha (1972)). Average crop yield is 450 kg/ha (for sorghum) but varies considerably depending on rainfall. Manmade flood recession areas are also found behind small and medium-sized dams in the rainfed area of the country and constitute a cultivable area ranging from 10,000 ha to 50,000 ha/annum depending on rainfall.

**Table 1: Paddy production and marketing subsidies,  
1992/93 - 1998/99**

Season	Production of paddy (T)	Production bought by the pool (T)	% of total production bought by the pool	Trarza's % of pool purchases	Average purchase price (UM/kg)	Interest rate for paddy purchase	Interest subsidy (millions of UM)
1992/93	37,045	6,600	18%	N/D	N/D	N/A	N/A
1993/94	31,920	15,400	48%	98%	26.0	N/A	N/A
1994/95	31,691	12,900	41%	89%	31.5	N/A	N/A
1995/96	55,000	15,400	28%	79%	41.6	12%	77
1996/97	66,700	28,250	42%	98%	42.0	14%	166
1997/98	80,942	44,800	55%	90%	42.1	17%	321
1998/99	83,000*	30,000**	36%	85%	42.0	20%	252

Sources: MDRE, UNCACEM, Gergely Report (1997) NA: Data unavailable N/A: not applicable

\* Rainy season 1998/99

\*\* Collection in progress (as of March 1999)

35. Limited agricultural credit resources. The only agricultural credit agency serving the rural environment is UNCACEM, whose capital comes essentially from grants from the Government and donors. Until recently, loans granted by UNCACEM were geared to rice and were only short-term seasonal credit, in addition to a small amount of medium-term credit for equipment purchases. Farmers, however, need short-term credit for diversification crops and long-term credit for rehabilitation, extension and the creation of new schemes. Also, short-term credit is needed for rice and other crop marketing.

36. Mauritanian commercial banks have essentially short-term liquidity assets and consequently provide only short-term loans. They shun agriculture-related activities, except for food imports (Table 2). Their behavior can be explained by the fact that the agricultural sector is perceived as risky due to: (i) its low level of performance; (ii) its great dependency upon the weather (risk of droughts) and uncontrollable natural phenomena; and (iii) the perishable nature of agricultural products. Also, rural credit has an uneven track record. Finally, there is little incentive for commercial banks to get into the local market since there is a credit agency, UNCACEM, that lends at 12 percent when the interest rate for short-term Treasury bills has been 16-17 percent, and market rates higher for average clients.

37. Inadequate road transport infrastructure. Access to remote areas, even to those with very great potential, such as the area between Rosso and Boghé, is difficult. In addition, the absence of competition among road transporters, due to a monopoly until recently held by the *Fédération nationale des transports*, has kept prices relatively high for producers in the Valley. This situation will certainly change as a result of the recent law (July 1998) on the liberalization of transport services, which has started being put into actual practice in May 1999. The same applies to air transport, the cost of which currently account for 50 percent of the value of agricultural exports.

38. Low-level of producer expertise. Many producers and farm organizations still lack basic knowledge of management and production techniques, and have limited access to agricultural extension. Regarding the low supply of horticultural products, the main constraints are producers' lack of experience with different varieties and cropping techniques, the absence of post-harvest infrastructures, and the lack of information on processing methods as well as on price trends, for local and export markets. Domestic research is weak and is not geared to farmers' needs. Results of regional and international research are not easily accessible to farmers. The IDA-supported Agricultural Services Project (ASP), initiated in 1994, has achieved positive, through limited, results.

**Table 2: Loans granted by Mauritanian commercial banks 1992 - 1997**  
(millions of UM: end of period)

	1992	1993	1994	1995	1996	1997	Average	%
<b>Short term</b>	<b>34,538</b>	<b>37,579</b>	<b>28,334</b>	<b>28,258</b>	<b>30,214</b>	<b>31,935</b>	<b>31,810</b>	<b>94.41%</b>
Agriculture & livestock	449	435	236	340	394	135	332	0.98%
Fisheries	12,758	13,931	10,634	10,594	9,391	8,546	10,976	32.57%
Mining	141	178	212	258	1	4	132	0.39%
Manufacturing	2,346	2,072	796	393	646	1,019	1,212	3.60%
Construction	1,156	1,080	786	857	597	444	820	2.43%
Transport	924	1,081	206	200	168	276	476	1.41%
Services	1,835	2,031	1,399	950	1,606	1,786	1,601	4.75%
Trade	11,364	13,062	9,850	9,694	10,926	12,518	11,236	33.35%
Other	3,565	3,709	4,216	4,971	6,487	7,206	5,026	14.92%
<b>Medium term</b>	<b>3,306</b>	<b>2,624</b>	<b>1,157</b>	<b>2,193</b>	<b>1,163</b>	<b>860</b>	<b>1,884</b>	<b>5.59%</b>
Agriculture & livestock	406	387	75	33	0	0	150	0.45%
Fisheries	1,457	884	486	494	372	159	642	1.91%
Manufacturing & construction	570	561	58	348	309	57	317	0.94%
Services & transport	356	328	364	472	23	131	279	0.83%
Other	517	464	176	846	460	513	496	1.47%
<b>TOTAL</b>	<b>37,844</b>	<b>40,203</b>	<b>29,492</b>	<b>30,451</b>	<b>31,377</b>	<b>32,795</b>	<b>33,694</b>	<b>100.00%</b>

Sources: IMF; Central Bank of Mauritania (from *Economic Intelligence Unit*)

39. Weakness of institutions supporting rural activities. The pool of qualified civil servants and technicians is limited, and there is a need to help the rural sector design, implement and monitor rural development strategies and programs. Information on the rural sector is also nonexistent, poorly organized or difficult to access for potential users, and especially for the private sector. The lack of capacity to collect, process and analyze statistical data on the sector makes monitoring and evaluation, as well as decision-making, difficult.

40. Environmental issues related to irrigation. In irrigated areas, water logging, salinity and waterborne diseases are important environmental threats. Water logging and salinity affect soil productivity, whereas waterborne illnesses have an impact on workers' productivity and thus on their incomes. In these areas, reduced flooding also has a detrimental effect on flood recession agriculture and on the replenishment of water tables that feed wells.

41. Abandonment of schemes. Out of a total potential area for irrigation in the Valley of 135,000 ha, a total of 40,000 ha have already been developed, almost exclusively for irrigated rice production. Unfortunately, half of this irrigated area has been abandoned due to various problems. Generally, the large publicly-financed schemes were well designed and relatively well maintained, but the same cannot be said of most small village-level irrigation schemes (put into production over the past 15-20 years) and individual schemes (created since 1987). For the latter two types, the expected regular maintenance and repairs have never occurred. In Trarza especially, the substandard design and implementation of individual self-financed schemes resulted in poor drainage and therefore in water logging and salinity. The results of the 1998 survey confirm that most of these schemes are in an advanced state of deterioration, as had been noted in 1994. One or a combination of the following problems are present on the schemes: frequent breakdown of motorpumps on nearly half (49 percent) of the schemes, faulty grading (48 percent of schemes), problems with primary canals (43 percent), infrastructures (26 percent), drains (22 percent) and secondary canals (22 percent). Other factors, including the above-mentioned lack of credit and poor management have contributed to the abandonment of mostly individual schemes, which is always preceded by a progressive drop in yields. Without rehabilitation, it is estimated that most of the

small village-level and individual schemes currently in production will meet the same fate in the near future (see hypothesis of economic analysis).

42. Slow pace of implementation of land tenure securement process. Secure land tenure became an issue in the irrigated zones once the regularization of the Senegal River's water regime and the provision of public infrastructures boosted land values and attracted new investors. Traditionally, these areas had been used by communities practicing rainfed or flood-recession agriculture and livestock raising under traditional tenure rights. Modern land tenure law, introduced in 1983, and its application decree which was revised in 1990, considers that land belongs to the Nation, that the State can distribute land, and that every citizen has a right access of land. Certain failings in the distribution procedures were noted once the land tenure law began to be applied, but the situation is now reasonably under control. Procedures for obtaining land use and property rights were defined, tested on a pilot basis in Trarza (under the IDA-supported PASA), and are now being applied to the rest of the Valley. There is a need, however, to prescribed technical norms for the creation/rehabilitation of schemes, and to demand that recipients respect the land development norms, starting with the initial obtainment of a land-use permit. This is important since the State has a stake in developing lands that were costly in terms of basic structural investments and that were subsequently awarded to users at relatively low cost.

43. Given the importance that the Government attaches to poverty alleviation, it will be necessary to establish mechanisms and a taxation system, allowing land in the Valley to be distributed as transparently and equitably as possible. It is worth repeating that of a total area of over 40,000 ha of irrigated land distributed by the State, only an area of about 20,000 ha is currently in production and is producing yields below 4 tons/ha with a cropping intensity of less than 1. This means that a large proportion of this precious land is unexploited or underexploited. Priority should therefore be given to developing lands already attributed and, eventually, to the re-assignment of these lands (in cases of non-exploitation or abandonment) rather than to assigning new parcels.

44. A series of measures will be taken to address the above-mentioned issues prior to the start-up of the IDPIAM, and over its first three-year phase.

### **Government Strategy**

45. The main goal of the Government's reform program is to alleviate poverty by means of accelerated private sector-led growth. The strategy for attaining this objective consists of: (i) assigning the rural sector a larger role within the economy; (ii) developing basic infrastructure; (iii) promoting private sector development; (iv) improving the environment for employment creation and poverty reduction; and (v) restructuring and modernizing the public sector. In this strategy, the rural sector is considered a major source of employment creation and income generation.

46. The Government, with Bank and donor assistance and with the participation of major stakeholders in the rural sector, recently developed a comprehensive rural development strategy (RDS) with four objectives: (i) promote the growth of diversified and competitive agriculture; (ii) integrate the livestock sector into the national economy; (iii) promote employment and alleviate poverty; and (iv) reduce the degradation of the natural resource base upon which agricultural production depends. This strategy was supported by the donor community (Consultative Group, March 1998). In the rainfed zones, the Bank already supports the Rainfed Natural Resources Management Project, whose objective is to control and, hopefully, reduce the spiral of poverty so well illustrated in this part of the world by the confluence of population growth, environmental degradation and reduced agricultural production. For the

irrigated part of the country, the Senegal River Valley, the proposed Program is an important step towards the implementation of this comprehensive rural development strategy.

47. The key policy and institutional reforms under consideration to support the Program are: (i) a simplified and transparent agricultural tariff policy – taking into account the fact that domestic taxes applied only to imported products increase the overall level of taxation of imported products; (ii) the elimination of the coupling of domestic marketing of paddy and import of rice; (iii) the liberalization of transport services; (iv) continued implementation of land tenure reform, with adequate safeguards and a monitoring system; (v) a clear incentive structure (including a credit system, a transparent investment subsidy framework, and the implementation of such reforms in banking and savings as would be recommended in the banking sector); and (vi) the establishment of a sound capacity within the Ministry of Rural Development and Environment (MDRE) for strategic planning, economic assessment, monitoring and evaluation, agricultural information and statistics, and coordination/cooperation. The progress and success of these reforms will be the triggers for the second phase of the (APL) Program.

48. The Government is to be commended for its commitment to liberalize the rice and transport sectors and to continue the implementation of land tenure rules and regulations, as is clearly indicated in the just agreed-upon 1999-2002 Policy Framework Paper (PFP). The Government has adopted in May 1999 a Letter of Development Policy for the irrigated sector (Annex 11), which reflects these measures. In the area of agricultural credit, the only rural credit institution in the country—UNCACEM—has committed itself to an interest rate policy to achieve operational and financial self-sufficiency.

### ***B3. Sector Issues to be Addressed by the Project and Strategic Choices***

49. The current economic, legal and institutional framework is a good basis for starting the Program with solid chances of success. However these policy measures need to be implemented, monitored and, if necessary, modified in the course of Phase I of the IDPIAM-IDA. The Program will help the Government strengthen the economic policy and legal framework and develop the institutional capacity of MDRE, SONADER and UNCACEM. (see Annex 2-A). It will also help address the main development issues of irrigated agriculture: access to credit, diversification and the development of technical and managerial capacities on the part of producers.

#### **Improvement of the economic policy and legal framework**

50. This will involve: (a) bringing Mauritania's agricultural tariffs into line with the customs regime of other countries in the region; (b) liberalizing the rice sector and implementing the accompanying measures; (c) pursuing the transport sector liberalization measures; (d) developing the design and implementation of norms for irrigation infrastructures in order to ensure the sustainable use of irrigated lands; (e) enforcing land legislation in accordance with recommendations of the land tenure study; (f) facilitating exports; and (g) adapting the legislation on farmer's organizations to the IDPIAM context.

#### **Strengthening the capacity of rural support institutions**

51. To strengthen the capacities of MDRE, emphasis will be on support to the MDRE's new Directorate for Policy and Monitoring/Evaluation (DPSE) as well as on consolidation and strengthening of the statistics-gathering system for the rural sector. For SONADER, the Project will support the recommendations that emerged from the study of this agency's restructuring. The State will bear the costs related to personnel reduction resulting from this restructuring. Technical assistance for UNCACEM will be financed under the Project in order to help the institution remedy its deficiencies and develop new products.

### Promotion of diversification

52. The IDPIAM's diversification component will help private operators, economic interest groups (GIEs) and cooperatives to take advantage of two avenues of diversification: the local and international markets. The IDPIAM will help set up a multidisciplinary taskforce charged with coordinating a program of pilot, private sector-led interventions, with the main objective of identifying and perfecting agronomic techniques (varieties, techniques) and logistical schemes (processing, refrigeration) that would make it possible to meet the needs of local markets and even of export markets. The objective during Phase I will be to increase the local market supply of competitively-priced fruits and vegetables from the Valley, and to have the beginnings of sustained export activity by the end of Phase I.

### Financing mechanisms, credit and matching grants

53. The Project will address the basic question of limited credit access (paragraphs 35 and 36). Financing, in the form of loans, will be provided to interested financial institutions to enable them to grant short, medium and long-term credit to producers and others involved in the rural sector. For the time being, the only financial institution active in the rural sector that has expressed an interest in pursuing and expanding its activities is UNCACEM (paragraph 35). In order to remove the obstacles (identified in paragraph 36) preventing commercial banks from financing rural activities, the following measures are being taken: (i) establishment of an incentive framework (credit system, matching grants, reform of savings and loan agencies); (ii) liberalization of the rice sector, which will lead to greater demand for credit, especially from rice growers; and (iii) demonstration effect of projects successfully financed by UNCACEM, which will show that risk management is possible and that agricultural lending can be profitable, including in the medium or long term.

54. Without assistance in the form of matching grants (complementary subsidy), the high cost of rehabilitation and equipment would be out of reach of the poorest populations with very limited capital. In addition, these borrowers would face severe cash flow problems since, in order to ensure the viability of the financing institution, the repayment period for long-term credit is much shorter (8 years) than the life of the investments (20 years). The Project will, therefore, grant targeted subsidies with the objective of limiting the level of indebtedness of the poorest producers who use credit. This subsidy, which will be a complement to the personal contribution and to credit obtained from UNCACEM, is considered to be the least costly way to help the poor, especially those living on collective schemes who consume much of what they produce. Indeed, allowing the poorest rural inhabitants to exploit the scarce resource of land is the most effective way to generate increased revenue and bring about a sustained reduction in poverty.

55. One alternative to the targeted investment subsidy would be a non-targeted, monetary subsidy to collectives and individual smallholders, in the hope that they would use the funds for productive and sustainable investments in agricultural production, marketing and processing. However, with such non-targeted subsidies – which would also have to be granted in a lump sum or in scheduled payouts – there is no effective way of monitoring; (i) beneficiary eligibility, and (ii) use of the funds for the intended purposes.

### Technical and managerial support to producers

56. This support is intended to remedy the managerial weakness of producers and producers' organizations and to improve technical expertise in the areas of irrigated scheme maintenance and production. This support is already being provided under the IDA-financed Agricultural Services Project (ASP) and will be strengthened under the Project (components (c), (d), and (e)).

## C. Summary Description of Phase I of the Program

(see Annex 2 for a detailed description and Annex 3 for a detailed cost analysis)

### C1. Components of Phase I of the Program

Components and sub-components (in US\$ '000)	IDA Financing		Total Financing <sup>1</sup>	
	Amount	%	Amount	%
<b>A. DEVELOPMENT OF A POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK</b>				
1. Improvement of the policy and legal framework	719	96.8	742	1.6
2. Strengthening of institutional capacities				
Support to MDRE	503	93.6	537	1.2
Support for an agro-pastoral information system	941	80.6	1,168	2.5
Support to SONADER	284	46.8	606	1.3
Support to UNCACEM	644	94.2	684	1.5
Subtotal Strengthening of institutional capacities	2,372	79.2	2,994	6.5
<b>Subtotal DEVELOPMENT OF A POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK</b>	<b>3,090</b>	<b>82.7</b>	<b>3,736</b>	<b>8.1</b>
<b>B. DEVELOPMENT OF BASIC INFRASTRUCTURES</b>				
1. Public infrastructure (hydraulics, communications/roads)	1,564	96.2	1,626	3.5
2. Rehabilitation / extention / creation of private irrigated schemes	7,435	78.8	9,438	20.5
3. Research and development	1,367	66.7	2,052	4.5
<b>Subtotal DEVELOP BASIC INFRASTRUCTURES</b>	<b>10,366</b>	<b>79.0</b>	<b>13,116</b>	<b>28.5</b>
<b>C. SUPPORT TO FARM MANAGEMENT AND ORGANIZATION</b>				
1. Support for farm management	1,029	92.9	1,108	2.4
<b>D. SUPPORT FOR TRADITIONAL CROPS SUBSECTOR</b>				
1. Support for traditional crops	10,072	86.1	11,700	25.4
<b>E. DIVERSIFICATION PROMOTION</b>				
1. Development of Infrastructure	1,649	59.5	2,770	6.0
2. Diversification promotion antenna	2,280	81.3	2,803	6.1
3. Diversification promotion activities	2,196	91.9	2,390	5.2
4. Quality Control	95	87.8	109	0.2
<b>Subtotal DIVERSIFICATION PROMOTION</b>	<b>6,219</b>	<b>77.0</b>	<b>8,072</b>	<b>17.5</b>
<b>F. ENVIRONMENTAL IMPACT MITIGATION MEASURES</b>				
1. Environmental monitoring/evaluation	948	88.6	1,069	2.3
2. Land use plans	600	83.1	722	1.6
3. Development of norms	45	94.1	48	0.1
4. Environmental impact mitigation measures	1,097	84.2	1,302	2.8
<b>Subtotal ENVIRONMENTAL IMPACT MITIGATION MEASURES</b>	<b>2,689</b>	<b>85.6</b>	<b>3,141</b>	<b>6.8</b>
<b>G. PROJECT MANAGEMENT AND MONITORING &amp; EVALUATION</b>				
1. Project Management	2,563	87.9	2,916	6.3
2. Monitoring and Evaluation	815	87.1	936	2.0
<b>Subtotal PROJECT MANAGEMENT AND MONITORING &amp; EVALUATION</b>	<b>3,377</b>	<b>87.7</b>	<b>3,852</b>	<b>8.4</b>
<b>H. PROJECT PREPARATION</b>	<b>1,300</b>	<b>100.0</b>	<b>1,300</b>	<b>2.8</b>
<b>TOTAL</b>	<b>38,143</b>	<b>82.9</b>	<b>46,025</b>	<b>100.0</b>

<sup>1</sup>Cost includes taxes and contingencies.

**C2. Main Policy and Institutional Reforms Supported by the Project**  
(See Section B3)

**C3. Benefits and Targeted Populations**

57. Benefits will include: (i) increased production, productivity and income of farmers in the irrigated areas; (ii) development of new employment-generating activities upstream and downstream of agricultural production; (iii) a greater role for rural communities and producers in decision-making; and (iv) better nutrition and health.

58. The main beneficiaries of the Program's Phase I will be over 2,000 smallholder families in the Valley (cooperative members) and numerous owners of small individual schemes who will receive credit and matching grants to rehabilitate or expand their irrigated schemes and who will receive assistance in the management and maintenance of infrastructures and in production techniques. Women's groups will benefit particularly from the Project through the diversification component, since women traditionally handle market gardening while the men devote themselves to cereals production. Another beneficiary group will be owners of medium-sized schemes who will, for the first time, have access to credit for the rehabilitation of irrigation schemes.

59. Most producers in the Valley will also benefit from the Project's interventions thanks to the development of rural public (non-farm) infrastructures; better access to capital and agricultural services; and to the enabling policy, legal and institutional environment that will be created.

60. Another important beneficiary category would be all rural and urban population—all rice consumers—who will, from now on, be able to obtain a better quality product at a lower price. They will also have access to locally produced fruits and vegetables that have, up until now, been imported and available only to the more affluent. The nutritional status of the poorest populations will thus be improved.

61. Indirect beneficiaries of this Project include: (i) rural and urban labor force, due to the increased job opportunities created in agriculture and its related activities; and (ii) private entrepreneurs engaged in the supply of agricultural inputs, equipment rental, manufacture/repair of agricultural equipment; and in the collection, processing and marketing of agricultural products for local and international markets. Other beneficiaries may include those involved in engineering and consulting.

**C4. Institutional Arrangements and Project Implementation**  
(see Annex 2-G1)

62. Overall responsibility for Project implementation will rest with the Ministry of Rural Development and Environment (MDRE). This responsibility will take into account the reform policy initiated by the Mauritanian Government, which recommends that ministries disengage themselves from certain implementation functions, leaving them to private operators, and that public service activities be reoriented towards policy, strategic planning, public investment planning and monitoring/evaluation. The following set-up is therefore envisaged:

- policy coordination of the IDPIAM will be handled by an Interministerial Coordinating Committee;
- guidance of the IDPIAM will be handled by a Steering Committee;
- a Project Coordinating Unit (CU-IDPIAM, already created) will be responsible for overall Project management and coordination, financial management and monitoring and evaluation;

- oversight of studies and public infrastructure works and assistance to producers in the areas of investment management and production techniques will be handled by SONADER;
- credit will be handled by UNCACEM; this function will be opened to other financial institutions under Phases II and III of the Program;
- support monitoring and control functions will be handled by various services within MDRE, namely: the Directorate for Planning and Monitoring/Evaluation (DPSE); the Directorate for Environment and Rural Equipment (DEAR), the Directorate for Research, Training and Extension (DRFV); and the Directorate for Agro-Pastoral Resources (DRAP);
- specialized support functions will be provided by services other than MDRE, namely: the National Statistics Office (ONS), NGOs, OSPs and GIEs.

## **D. Program and Project Rationale**

### ***D1. Lessons Learned and Reflected in the Program and the Project Design***

63. The Program and the Project design draws from: (i) IDA's and other donors' assistance to Mauritania; (ii) Mauritania's own experience in irrigated agriculture (over 20 years); (iii) experience in other countries in the region; and (iv) the Bank's worldwide experience in irrigation development. These experiences are mentioned in the sectoral questions addressed in the preceding paragraphs. Several valuable lessons have been derived from this experience and from IDA's involvement in irrigation – particularly the Agricultural Adjustment and Investment Project (Cr. 2093-MR) and the Small-Scale Irrigation Project (Cr. 1571-MR):

- rice produced in large-scale irrigation projects requiring an extensive and sophisticated irrigation and drainage network and heavy pumping equipment is generally not economically viable because production costs are too high to compete against imported rice. In addition, individual large schemes involve salaried labor and even mechanization, resulting in even higher costs than in collective irrigated schemes. Conversely, rice production on small irrigated schemes, especially if they use family labor, can be economically sustainable;
- rice production achieved in the Middle and Upper Valley is less subject to competition from imported rice (via the port of Nouakchott) since it supplies a nearby (local and hinterland) market where it has a competitive advantage due to transport costs;
- to be sustainable, irrigated agriculture must produce more than one harvest per year, promote diversification, and integrate other rural activities such as livestock raising, silviculture and river fishing;
- operation and maintenance (O&M) of collective hydraulic infrastructures can only be sustainable if beneficiaries are made directly responsible for it. However, public services must provide them with training to organize themselves;
- the management of large collective schemes, currently assisted to a great extent by SONADER, must be transferred to cooperatives in a gradual fashion after the appropriate preparation and training of beneficiaries. Any unplanned transfer that is not accompanied by assistance is doomed to failure;
- credit is indispensable for irrigated agriculture, not only for crop production and marketing (short-term), but also, and especially, for the equipment of schemes (medium- and long-term.); Complete subsidization, even for the poorest populations, has a very detrimental effect;

- access to credit is a powerful instrument of gaining access to land; therefore, adequate mechanisms should ensure that credit is equitably distributed in accordance with basic credit access principles;
- poor drainage is one of the main causes of such environmental problems as water logging and salinity;
- major infrastructure, such as irrigation, drainage and access roads, is essential to the promotion of irrigated agriculture and requires the financial support of the Government (public funds); and
- policy reforms carried out under the AGSECAL must be updated and pursued.

64. Other lessons can be learned from previous experiences: (i) the practice of rice monoculture and the emphasis on food self-sufficiency have not fostered the emergence of a modern and competitive agriculture, nor has it reduced rural poverty; (ii) the heavy dependency of this monoculture on public financing has not allowed a self-sustaining irrigated agriculture to develop; and (iii) the fragmented and uncoordinated donor assistance has made it difficult for the Government to set priorities and manage human, material and financial resources properly.

65. Based on these lessons learned from past experience, the Program and the Project will implement the following recommendations:

- Design of irrigated schemes. Rehabilitation, extension and/or creation of new schemes to be carried out under the proposed Program must be viable from the technical, economic and environmental standpoints and must conform to norms set out in the Implementation Manual for Phase-I. In the event that norms are not respected, the farmer: (i) will not receive authorization to rehabilitate, extend or create new schemes; (ii) will not get access to credit or subsidies; (iii) may be subject to fines if he/she proceeds to violate norms; and (iv) could lose his/her rights over the land in this case, temporary concession. The Government will update MDRE Circular No. 008 concerning management norms for irrigated schemes and will publish an Implementation Manual.
- Matching grants (complementary subsidies). In addition to short-term credit already available for working capital, farmers will have access to medium- and long- term credit, as well as to subsidies (for the poorest) to allow them to design, implement and equip their schemes properly and to have technically, economically and environmentally viable farms.
- Technical and managerial expertise. Assistance to farmers (one of the Project's main components) will increase their level of technical and managerial know-how.
- Monitoring of project implementation and impacts. A sound monitoring and evaluation system using effective indicators and beneficiary assessments, will be set up to ensure proper Project implementation, measure impacts and provide decision-makers with relevant information for timely adjustments.

## ***D2. Program Alternatives Considered, Reasons for Rejection and Rationale for an APL***

66. Achieving the main objective of the Program (to increase agricultural value-added, rural employment and income, and reduce poverty) will require a coherent and well-integrated set of actions in the areas of: (i) economic, legal and institutional policies; (ii) infrastructure investments; (iii) strengthening of farmers' capacities for management; (iv) helping farmers water production,

diversification, processing and marketing skills; (v) development of financial intermediation; and (vi) environmental protection.

67. The option chosen was the integrated and participatory rural development approach. This approach has the advantage of being all-encompassing and of taking into account all the key problems that arise. It has the disadvantage, however, of being complex and difficult to grasp and implement. Because it seeks to be participatory, it cannot propose a blueprint, i.e. an elaborate work and investment program prior to project start-up, since the Program is supposed to be designed as its implementation proceeds and as the various participants take things in hand. The approach must, therefore, be flexible and iterative.

68. Four other options were considered for this Program.

- The first option was to consider another project of the Small-Scale Irrigation, or irrigated village perimeter type, with subsidies for scheme rehabilitation and assistance to producers in the areas of management and production techniques, with a view to reducing poverty. This formula was rejected since rehabilitation in itself does not resolve issues related to marketing, competitiveness and long-term financing.
- The second option considered was to provide short-, medium- and long-term credit lines at market rates and allow private initiative to take its course. This would have resulted either in under-utilization of financial resources if the credit institution were to behave with the required prudence, or in bankruptcy if this institution were to respond to credit requests hastily and without in-depth examination.
- The third option envisioned was a series of small sub-sectoral projects, each dealing with one aspect of the problem. One advantage of this formula would have been simpler projects to manage. The drawbacks would have been: the problem and the expense of coordination among numerous projects; the waste of human resources for the preparation and management of several projects; and the absence of any guarantee that all projects would receive support and be implemented at the required time. Experience has shown that coordination among projects is one of the biggest difficulties, especially when they are financed by different donors.
- The fourth option was a hybrid sector adjustment/investment operation such as the preceding AGSECAL. The disadvantage of this approach is that the adjustment measures are not sufficiently linked to the investment operation itself, and that these measures are often taken to satisfy the requirement of rapid disbursement rather than as proof of true Government commitment to the proposed reforms. In addition, rapidly disbursed funds under sectoral adjustment operations do not necessarily benefit the sector for which they are theoretically intended.

#### Rationale for an APL

69. Before engaging in an ambitious and costly investment program, Mauritania must: (i) create an enabling environment in terms of policies for import taxation, transportation, land tenure, and rural financing; (ii) demonstrate the success of new technologies and new crops; (iii) develop the base for economically sustainable crop production; (iv) bring farmers up to a satisfactory level of technological know-how and organization; (v) scout markets to identify commercial niches; and (vi) launch feasibility studies for future major infrastructure works. These reasons justify the phased approach that an APL offers. Also, the investments that the Government and private sector must make are long-term

investments that require long-term commitment on the part of all partners, including donors. These investments are also part of the overall IDPIAM which spans a period of eleven years and involves several donors. This overall program is part of the Government's Rural Development Strategy which has been supported by the donor community. Finally problems of poverty alleviation do not have short-term solutions.

70. The proposed long-term APL:

- is linked to long-term (6-10 years) interventions (infrastructures);
- grants financing for a long-term (11 year) development strategy, beginning with an initial series of interventions, in accordance with agreed-upon triggering events and objectives;
- has discrete, divisible and phased investments, with physical targets for rehabilitation over a long time horizon;
- includes a logical sequence of events and a phasing of activities defined by milestones (triggers) and policy requirements; and
- follows demonstrable cost-benefit and program justification based on broadly acknowledged economic parameters, such as improved yields, increased cropping intensity, and diversification.

**D3. Major Related Projects**

(financed by the World Bank and/or other development partners)  
(completed, ongoing, and planned )

Sector Issue	Project	Latest Supervision Ratings (Form 590) (Bank-financed project only)	
		Implementation progress (IP)	Development objective (DO)
<u>Bank-financed</u>			
Natural Resource Management	Rainfed Natural Resources Management (Cr. 2965 – FY 1997)	S	S
Ag. Extension, Research and Training	Ag. Services (Cr. 2575 – FY 1994)	S	S
Ag. Adjustment and Irrigation	Ag Sector Adjustment and Investment (Cr. 2093 – FY 1990)	S	S
Livestock	Livestock II (Cr. 16580 – FY 1986)	S	S
Irrigation	Small-Scale Irrigation (Cr. 1571 – FY 1985)	NA	NA
Irrigation	Gorgol Noir Irrigation (Cr. 1068 – FY 1981)	NA	NA
Irrigation	Technical Assistance to SONADER (Cr. 694 – FY 1977)	NA	NA
<u>Other development agencies</u>			
Ag. Extension	PSSA (FAO)		
Credit	Line of Credit and Technical Assistance to UNCACEM (Germany)		
Irrigation	Maghama 3 Irrigation Scheme (Islamic Development Bank / Saudi Development Fund)		
Irrigation	PPG2 - Gorgol Irrigated Pilot Scheme (European Union)		
Irrigation	Access Road and Drainage at Fom Gleita (Abu Dhabi)		
Irrigation	Lac R'kiz Scheme (IDB)		
Irrigation	M'Pourié Scheme (IFAD)		

IP/DO Ratings: HS (highly satisfactory), S (satisfactory), U (unsatisfactory), HU (highly unsatisfactory), NA (not applicable)

#### ***D4. Indications of Borrower Commitment and Ownership***

71. In 1995, the Borrower prepared a long-term development strategy for the Senegal River Valley (the overall IDPIAM), which was presented to the donor community at a roundtable in October 1995, and received their support. In 1997/98, the Government prepared a countrywide Rural Development Strategy (RDS) which confirmed the importance given to the development of the Valley. The RDS was presented at the March 1998 Consultative Group Meeting and was positively received by the donor community. In May 1999, to confirm its commitments and to support its request to IDA for the funding of the Program, the Government prepared and approved a Letter of Development Policy for Irrigated Agriculture (LDPIA) for the period 1999-2010. Although the process has been slow, there is no doubt that a profound paradigm shift is occurring at all levels. The Government willingness to move away from past, unsuccessful practices is demonstrated by the following decisions it has recently taken:

- commitment (letter dated May 9, 1999) to: (a) no longer subsidize the interest rate on loans for local rice marketing; (b) avoid intervening in the determination of domestic paddy prices; and (c) guarantee that private importers will not be forced to buy a quota of local rice in order to import rice (see Annex 2A par. 3);
- announcement made to all parties involved in the rice sector of above Government measures (letter dated May 16, 1999);
- agreement on a draft joint circular to be issued by the Ministries of Development and Environment, Interior and Hydraulics setting out minimum technical norms for irrigated schemes to be respected by users (May 19, 1999);
- preparation of a draft Performance Contract for SONADER and agreement and changes to be introduced (Government letter dated May 18, 1999); and
- adoption by UNCACEM of an interest rate policy geared to ensuring its operational self-sufficiency by FY2000 and its financial self-sufficiency by the end of 2001.

#### ***D5. Value-Added of Bank Support in this Program***

72. The proposed Program involves investment components supported by capacity-building measures and institutional and policy measures comparable to those initiated under the AGSECAL (1990-1996). The Bank has a definite comparative advantage in supporting such a comprehensive approach and has played a lead role in supporting the AGSECAL, the IDPIAM and the RDS. Since the October 1995 roundtable in Mauritania, donors have expected the Bank to assume that leadership, and some have delayed operations, waiting for the Bank to jump start the IDPIAM. IDA will therefore continue to make every effort to work in close collaboration with other donors interested in funding parts of the overall Mauritania-IDPIAM program. In order, however, to avoid complicating financing procedures, a decision was made to work closely with other donors in the framework of the overall IDPIAM, but not to seek formal joint funding of the program, at least not during the first (three-year) phase of the APL.

#### **E. Summary Cost-Benefit and Financial Analysis of the Project**

(Detailed assessments are in the project files, see Annexes 4 and 5)

73. The Project's main benefits will be: (a) increased agricultural income for producers on rehabilitated or newly created irrigation schemes and (b) better maintenance of the irrigated schemes to secure high and sustainable yields. The Project will have spillover effects upstream and downstream through the creation of employment and non-farm revenues.

74. The construction of wells will help reduce the incidence of waterborne diseases and will reduce the drudgery of the women's water-carrying chores. These activities are highly cost-effective (costing less than US\$ 100 per Disability-Adjusted Life-Year (DALY) saved. Activities geared to increasing accessibility through the construction of small bridges and culverts on access roads, in anticipation of the construction of rural roads under Phase II (following feasibility studies), will make it possible to open up areas of high potential that had thus far been isolated.

75. Cost-benefit analysis has been undertaken for the infrastructure components dealing with rehabilitated and newly created schemes under Phase I, the plan being to develop 3,100 ha during this first phase. Only tangible, direct and measurable benefits have been taken into account, but other indirect benefits will help contribute to the Project's economic return. Since investments are carried out on demand, the sites and scope of activities are not known beforehand. The analysis is therefore illustrative, and will be repeated during implementation for each request to ensure that the Project supports only financially and economically viable operations. Thirteen farm models were considered..

**E1. Economic Analysis**  
(See Annex 4)

Cost-Benefit Analysis of Schemes: NPV= US\$6.4 million; ERR = 28.5 percent  
(1 \$US = 205 UM, US\$ million, base year: 1999)

**Current value of flows 12 percent  
For all of the 3,100 ha under Phase I**

	UM\$ millions		US\$ millions	
	Economic Analysis	Financial Analysis	Economic Analysis	Financial Analysis
<b>Benefits</b>				
Operating revenues	2,376	3,096	11.6	15.1
Investment costs	-1,061	-1,261	-5.2	-6.2
Net additional benefits	1,315	1,835	6.4	9.0
<b>IRR</b>	<b>28.4%</b>	<b>28.5%</b>	<b>28.4%</b>	<b>28.5%</b>

76. Cost-benefit summary. The economic rate of return (ERR) for the farm models ranges from 17 percent (model: rice, individual farmers in Trarza) to over 200 percent (model: vegetables, cooperative farmers in Trarza), with, in between, a rate of 38 percent (model: rice + vegetables + windbreaks, collective producers in the Haut Fleuve). The natural protection enjoyed by the Haut Fleuve (because of its distance from Nouakchott, the entry point for imported rice) and the use of family labor on collective schemes increase the profitability of the rice model for collective producers in this region (ERR = 19 percent). The crop diversification model (rice + vegetables + windbreaks) seems to offer the best large-scale prospects (see Annex 4). The overall ERR is 28.4 percent, based on the estimated distribution of the selected models and the calendar for the rehabilitation work on 3,100 ha during the three years of Phase I (which obviously cannot be predicted).

77. Key assumptions. The underlying key assumption are that:

- (a) production and agricultural income (rice and diversification crops for the local market) will increase under the "with project" scenario relative to the "without project" scenario;

- (b) improvement of irrigation schemes and of agricultural services will result in increased yields and cropping intensity, especially for rice. Under similar ecological conditions, the best Senegalese producers in the Delta obtain year after year 10 tons of paddy/ha;
- (c) without the Project, most irrigated schemes would not have access to credit and would suffer considerable deterioration (see paragraph 41). Indeed, the IDPIAM will not be assisting large, well-designed and relatively well-maintained collective schemes, but instead small village/community schemes (over 15-20 years old) and individual schemes (over 5-10 years old). These were meant to be regularly maintained and quickly repaired, when necessary, but such work has not been performed (see pa. 41);
- (d) there is a constant estimated price of US\$ 200 FOB Bangkok on which the parity price of rice is based;
- (e) the liberalization of the rice sector and its accompanying measures will improve the quality of paddy (10 percent discount relative to imported rice) and the processing rate (65 percent); and
- (f) the long-term opportunity cost of capital in Mauritania is estimated at 12 percent, a figure considered as at the high end.

78. Sensitivity analysis. The sensitivity analysis is based on estimated switching values (a change in the value of key factors that lowers the ERR to 12 percent, taken as the long-term opportunity cost of capital in Mauritania). The risk threatening the achievement of the Project's economic benefits could come from reduced paddy yields, reduced paddy prices, or from an increase in the foreign exchange rate (Annex 4). These risks are higher for individual rice-only producers (switching values in these cases are -9 percent for paddy yields and -12 percent for paddy prices) compared to those for collective rice farmers in the Haut-Fleuve (switching values of -17 percent for paddy yields and -24 percent for paddy prices). The benefits from diversified crops, and especially vegetable production systems, are much less susceptible to these risks.

79. In order to reduce the risks associated with declining paddy yields, the Project will require better design of irrigated schemes and will support better access to credit and to agricultural services (including farmer-to-farmer visits to extend best practices). The Project has developed a comprehensive package aimed at improving rice productivity (Annex 2-D). To buffer the impact of fluctuations in rice prices – and therefore in farmers' incomes – the Project will provide incentives to producers to diversify their crops to reduce their dependency on rice, and will develop an information system to keep farmers up-to-date on market conditions.

## ***E2. Financial Analysis*** (see Annex 5)

Cost-benefit analysis of schemes: NPV = US\$ 9.0 millions; ERR = 28.5

80. Summary of costs and benefits. The financial rate of return (FRR) for the various farm models ranges from 19 percent (model: rice-only, individual farmers in Trarza) to over 100 percent (model: vegetables, cooperative farmers in Trarza) with, between, a rate of 37 percent (model: the rice + vegetables + windbreaks, cooperative producers in the Haut Fleuve). As is the case for economic benefits, crop diversification offers the best large-scale prospects. Overall, for the 3,100 ha of schemes developed under Phase I, the net financial benefits of the Project are substantial, as indicated by the net present value (NPV) and the FRR (28.5 percent).

81. Key assumptions. The main assumption (aside from those concerning improved paddy yields and the parity price of paddy) is a tariff of 23 percent (DFI + TST), taken as overall long-term taxation of imported rice. Mauritania is committed to simplifying and reducing its tariffs and to bringing them into

line with those of other countries in the region. Since those other countries do not – in connection with poverty alleviation efforts – impose internal taxes (VAT or FMI) on staples such as rice, Mauritania is expected to follow suit in time. There will be no financing of public infrastructures for which recovery of management or maintenance costs have not been considered.

82. Sensitivity analysis. Risks are associated with declining paddy yields (switching value –11 percent for rice-only individuals in Trarza), with declining paddy prices (switching value –12 percent in Trarza), and with an increase in the foreign exchange rate (switching value 15 percent), but there is relatively little risk associated with increased costs of the irrigated schemes. These risks are relatively less severe for rice collective farmers in the Haut Fleuve. The impact of a cost overrun on a scheme is small when it is assessed over the project's 20-year lifespan, but its effect could be catastrophic over the short term since it would affect producers' ability to repay their loans (over 8 years). The impact of tariff reductions on prices is diluted in part by the high local distribution costs which are, for the most part, fixed.

83. Risk-reduction measures suggested by the economic analysis will have a similar impact on financial benefits. For collective producers and individuals with parcels of less than 40 ha, the subsidy will help reduce their cash flow constraints, and therefore will reduce the risks identified in the sensitivity analysis.

### ***E3. Analysis of the Financial Institution*** (See Annex 5)

84. UNCACEM faced large operating losses during the first years of its existence due to: (a) high provisions for unrecoverable loan losses that had not been sufficiently provisioned during those initial years; (b) relatively high operating costs relative to a low level of activity; (c) low interest rates (12 percent for all types of credit, whereas market rates climbed much higher (to 17 percent or more). This situation has improved considerably since 1997: credit recovery rates improved significantly, reaching 97 percent, and a financial adjustment was made in May 1999.

85. As a condition for negotiations, UNCACEM agreed to adjust its interest rates in order to achieve financial self-sustainability by the second year of the project at the latest (paragraph 71).

### ***E4. Fiscal Impact*** (See Annex 5)

86. The Project's fiscal impact on the Government budget will be positive. The net present value of the investment subsidy will be almost entirely offset by taxes on agricultural inputs and production equipment. The net present value of beneficiaries' contributions will also be higher than that of the investment subsidy.

87. Inflows include IDA disbursements, the reimbursement of the line of credit to UNCACEM, import taxes on agricultural inputs and equipment and savings derived from the elimination of subsidies on paddy marketing (see Strategic Context). UNCACEM will repay the line of credit with interest covering the IDA service charge, the exchange risk and the Government's charges for managing the funds.

88. Outflows will finance: (i) the line of credit to UNCACEM; (ii) the investment subsidy; (iii) other matching grants (financing the construction of small storage units for poor collectives and the pilot diversification operation); (iv) extension and research; and (v) roads and social service infrastructures.

Additional recurrent declining costs (progressively phased out over 5 years after the end of the Project) are estimated net of taxes. Because of the additional local rice production, the Government will lose out on taxes on the equivalent imported rice, but this loss corresponds to a gain for producers.

### ***E5. Technical Analysis***

89. Rehabilitation, extension and new creation works will be designed, implemented and maintained in accordance with technical norms defined by the Government. MDRE's Circular No. 008 specifies technical norms for the calibration of irrigation and drainage works, and for the size and leveling of parcels. These norms have been updated and set out in a circular to be issued jointly by the MDRE and other ministries responsible for – or involved in – their application. A draft circular accepted by IDA has been accepted as a condition of negotiations of Phase-I of the IDPIAM-IDA. These norms will ensure that public lands, up to now distributed at little cost to farmers, with credit and subsidies made available to them to develop these lands, as well as public funds invested in the creation of rural public infrastructures (dams, dikes, drainage ditches, canals and roads) are used in the most efficient manner from the social, economic and environmental standpoints. These norms take into account the environmental particularities of the Valley (salinity and water logging) by emphasizing appropriate drainage systems. Respect of these norms will be a condition for access to temporary and permanent land concessions. It would also be a condition of access to investment credit and subsidies. Information, extension and training programs will strengthen producers' technical know-how. These programs will include the introduction of new irrigation technologies to be tested.

### ***E6. Institutional Analysis***

90. Despite their long experience, MDRE and SONADER's capacities need to be improved. Faced with changes in the Government's role and the rise of the private sector, these institutions have been unable to adapt and have seen their funding sources (essentially external aid) dry up while they still retain large staffs, some of them with outdated skills. They therefore need to be restructured. This is especially true of SONADER, which is to play a key role in the implementation of the Program.

91. For MDRE, the emphasis will be on supporting the Directorate for Policy and Monitoring/Evaluation (DPSE), which will be set up in 1999 and made responsible for coordination between (a) MDRE's various departments; (b) MDRE and its decentralized agencies; and (c) MDRE, other ministries, NGOs and development agencies. Under Project funding, the *Office national de la statistique* (ONS) will assist MDRE in restructuring, strengthening and making more effective its statistical services.

92. SONADER's mandate and work program have been defined in a performance contract that is currently being ratified by the Government. This performance contract will be accompanied by a restructuring to be carried out during Phase I of the Program, on the basis of a study planned for the second half of 1999.

93. Funding has been earmarked under the Agricultural Services Project for the development and strengthening of the capacities of these two institutions (MDRE and SONADER). Additional interventions will be financed under the Project.

94. UNCACEM currently receives full-time technical assistance from France and Germany, under a contract due to run out soon. It has been agreed that technical assistance will be provided under the Project but on a declining basis and with a specific plan for training local managers (local capacity

building) and for the phased withdrawal of this technical assistance. Such assistance must not become a substitute for local staff.

95. Since MDRE, SONADER and UNCACEM are receiving support from several donors under various projects, every effort will be made to coordinate with other donors the necessary technical assistance in the areas of capacity- building and project management.

### *E7. Social Analysis*

96. Poverty . The Project will target poor farmers and vulnerable groups by helping them obtain better access to agricultural credit and subsidies for productive investments and rural infrastructures; to land; and to know-how (training and extension); and by promoting women development. It will support farmer participation in the design, implementation, management and maintenance of investments. Data collection and analysis for a participatory evaluation of the Project's social impact has been carried out on a sampling of schemes. The results of the analysis helped improve Project design and work out the best ways of reaching the target groups. There were also used to test the diagnostic tools that will subsequently be part of the Project's monitoring and evaluation system (M&E).

97. Access to credit and subsidies. Targeted subsidies for irrigated schemes rehabilitation or extension will be granted under the Project to cooperatives whose members have individual parcels of 2 ha or less on average, and to individuals owning total areas of less than 40 ha or less under rice. Similarly, subsidies will be made available for the development of new small irrigated schemes (less than 5 ha) intended for diversification by cooperatives or individuals. Safeguards will be introduced to ensure the transparency of lines of credit and subsidies and to ensure that these resources go to those beneficiaries for whom they are intended.

98. Access to land. The current land tenure system guarantees in principle: (i) equitable access to land; (ii) priority access to this land for communities living in the Valley and their involvement in decision-making; and (iii) the preservation of land tenure rights of the poor. There are currently three agencies and one commission monitoring the enforcement of land tenure laws: The Ministry of the Interior (Land Registrar's Office); the Ministry of Rural Development and Environment (Office of Land Tenure); the Ministry of Finance (Office of Property Tax) and the Consultative Commission on Land Tenure. The land tenure system does not pose a problem in and of itself for the proposed Project. However, the situation will be closely monitored, and no financial support will be authorized for irrigation schemes affected by land tenure conflicts.

99. Access to know-how. The provision of basic technical assistance (through the extension sub-component) that poor smallholders need most will also help reduce the incidence of poverty.

100. Women's issues . Investment in drinking water to improve rural health and reduce the amount of time spent carrying water on long distances, especially by women, will help reduce poverty and free up women's productive capacity. This capacity will be used for market gardening activities, traditionally managed by women, that generate a great deal of value-added.

### ***E8. Environmental Assessment***

Environmental category       A     B     C

101. The Project and the Program area face environmental problems caused by: (i) existing infrastructures (the Manantali and Diama dams and major hydraulic canals); and (ii) infrastructures that will be created under the program. The latter include: (a) major public civil works (main canals and drains, etc.); (b) minor public works (connecting roads, small bridges, etc.); (c) the rehabilitation, extension and creation of small irrigated schemes; and (d) small village infrastructures (wells, grain storage, etc.). According to Bank procedures, only the infrastructures described under (a) belong to environmental category A; the rest are in category B. The program as a whole, however, is classified as category A.

102. During Phase I of the Program, there will be no major infrastructure works, but instead only feasibility studies which will include environmental impact assessments (EIAs). Land use plans will be prepared in a participatory manner and technical and management procedures will be prescribed to ensure sound environmental management. For all new activities to be carried out on the irrigated schemes, satisfactory EIAs will have to be produced. In addition, a system of environmental monitoring for the Valley will be developed and enforced to help decision-makers take adequate preventive and mitigation measures. Funds will be mobilized under IDPIAM to finance impact mitigation measures identified in the course of Project preparation and during implementation. Details are provided in the Working Paper on the environment available in the Project files.

103. Works aimed at rehabilitating and exploiting existing or new irrigated schemes will have an impact on waterborne illnesses such as intestinal parasites, bilharzia and malaria. IDA funds have been made available to Mauritania under the Second Health Project, especially for efforts to combat waterborne diseases. Measures to mitigate health impacts will therefore be financed under that project. The IDPIAM will finance annual surveys of the effects of new infrastructures on the incidence of infectious diseases and will propose mitigating measures to be financed under the Health Project.

### ***E9. Participatory Approach***

#### Main beneficiaries and other affected groups

104. The Project deals mainly with the rehabilitation of some existing irrigated schemes whose owners are well known. They have been consulted throughout the process and have been involved in the diagnostic and design steps leading up to the IDPIAM. In any case, it is important to stress that the selection of the irrigated schemes to be supported under the Project and the nature of the works to be carried out will not be determined by IDPIAM staff but rather by the owners of the schemes themselves, who will need to make explicit requests. They will further have to make a personal direct contribution (in cash or in kind) and finance part of the investment by means of a personal loan from a credit agency (UNCACEM). The IDPIAM can not, therefore, be implemented without their solid commitment and will. There is no doubt that some producers would prefer to maintain the status quo, i.e. the Government pursuing a protectionist approach (high tariff barriers for imported rice), total or partial interest subsidy for loans for production, marketing and equipment purchase; total subsidization of irrigated perimeter development (for collectives). Frequent, long and animated debates have taken place to persuade farmers that the short-term view was totally unsustainable and, it was, in fact, keeping them in a permanent state of dependency and semi poverty, whereas the IDPIAM was aimed at significantly improving their socio-economic conditions. Women were particularly supportive as they are the most involved in crop

diversification (vegetables) – the most promising market niche and one for which they will henceforth be able to get credit as well as technical and marketing advice.

#### Other key stakeholders

105. People providing services to producers or involved upstream or downstream of production have participated in various stages of project preparation. This was the case for suppliers of agricultural equipment and inputs, rice mills, transporters, NGOs, institutions involved in training, research and extension, buyers and importers of rice and other agricultural products. Representatives of local and central government agencies also participated in all stages: diagnosis, definition of objectives, intervention strategies and action plans. The main donors were consulted throughout the process.

## **F. Sustainability and Risks**

### ***F1. Sustainability***

106. All irrigation investments, to be selected for funding, will have to demonstrate their economic and financial profitability. Long-term profitability can be affected by the success (or failure) of the establishment of water and maintenance fees, and the recovery of a reasonable and acceptable proportion of those fees. Clear procedures for setting, collecting and managing the use of those fees will be developed and enforced. Adverse world market fluctuations would pose risks for local agricultural production with increased integration into world markets. Providing better market information to market participants and by promoting diversified agricultural production and processing activities would mitigate this.

**F2. Critical Risks**

(reflecting assumptions in the fourth column of Annex 1):

<b>Risk</b>	<b>Risk Rating</b>	<b>Risk Minimization Measures</b>
<b>Annex 1-cell "from outputs to objective"</b>		
• Appropriate transport and marketing policy	M	• Coordinated action with other sectors and programs concerned by same issue
• Appropriate fiscal and tariff policy	S	• Maintain regular policy dialogue. Support policy analysis and implementation via PFP and CAS exercises.
• Capacity for monitoring implementation of existing policies	M	• Support to the newly created Policy and Monitoring & Evaluation Directorate • Incorporate measures in PFP and CAS
• Efficient and equitable financial intervention	S	• Development of capacities, technical assistance, donor coordination, effective monitoring and supervision, audits
• Coordination capacity of public and private agencies involved in management and organization training	M	• Maintain effective monitoring
<b>Annex 1-cell "from Components to Outputs"</b>		
• Capacity of Project's participants to effectively plan, monitor and evaluate their activities	M	• Establishment of a sound M&E system
• Competence of project staff and support services (technically and managerially) and adequate coordination	S	• Stringent recruitment criteria, better selection procedures, training, and performance monitoring and evaluation.
• Stability of project staff	M	• Better incentives and working conditions
• Efficient extension and training system	M	• Strong linkage and regular dialogue with Ag. Services Projects. More demand-driven program. • Good performance monitoring and evaluation
• Adequate market facilitation	S	• Efficient market information systems. Beneficiary involvement.
• Good donor coordination	M	• Formal and regular donors' meetings and systematic exchange of information and reports.
• Good Government coordination	M	• Formal and regular govt.-donor-beneficiary meetings
<b>Overall Risk Rating</b>	M	• Well designed and effective Project Monitoring and Evaluation

*Risk Rating - H (High Risk), S (Substantial Risk), M (Moderate Risk), N (Negligible or Low Risk)*

**F3. Possible Controversial Aspects**

<b>Risk</b>	<b>Type of Risk</b>	<b>Risk Rating</b>	<b>Risk Minimization Measure</b>
Social conflicts	S	M	Ensure that land tenure law is applied with transparency and equity based on the Trarza pilot operation.
Spread of waterborne diseases	O	S	Proper sanitation, hygiene education and treatment, and adequate water supply points.

Type of risk: S (social), E (Ecological), P (pollution), G (governance), M (management capacity), O (other)

107. Other Project risks include the non-respect of land tenure law, especially vis-à-vis the poorest farmers. There will be no credit or subsidy without a land-tenure documents (authorization to cultivate temporary or permanent concession). In addition, such legal documents will be used to prevent borrowers from trying to circumvent the credit limit set for rehabilitation. Given the critical importance of this issue, careful stakeholder analysis has been undertaken during appraisal and recommendations are made for monitoring and evaluation. As for the credit institution, UNCACEM, it was subjected to intensive review to ensure effective credit delivery. UNCACEM will be closely monitored and is expected to achieve operational and financial self-sufficiency during Phase I (a trigger for Phase II). To mitigate the effects of foreign exchange fluctuations, the World Bank and IMF are helping the Government to implement sound monetary and exchange rate policy reforms.

**G. Main Loan Conditions**

**G1. Effectiveness Conditions**

108. To satisfy effectiveness conditions, the following measures must be taken in a manner judged satisfactory by the Bank:

- (a) establishment of a Project Account and deposit into such account of the initial amount;
- (b) selection of independent auditors for the financial and accounts audit of all accounts of IDPIAM (UC-IDPIAM, SONADER and UNCACEM);
- (c) establishment of a computerized accounting and financial information management system in UC-PDIAIM, acceptable to the Association and appointment of a financial specialist/accountant;
- (d) establishment of a procurement management system in UC-PDIAIM acceptable to the Association and appointment of a procurement specialist;
- (e) establishment of a computerized monitoring and evaluation system in UC-PDIAIM acceptable to the Association and appointment of a monitoring and evaluation specialist;

- (f) adoption of the Project Implementation Manual, and the Grant Procedural Manual, each in form and substance acceptable to the Association; and

## ***G2. Conditions of Negotiations***

109. The following conditions of negotiations have been fulfilled in a manner satisfactory to the Bank:
- (a) commitment on the part of Government to take necessary measures to ensure production, processing and marketing of rice, as stipulated in Annex 2 of this document (Government letter dated May 9, 1999);
  - (b) announcement made to all parties involved in the rice sector of Government measures regarding production, processing and marketing of rice (Government letter dated May 16, 1999);
  - (c) adoption by Government of a Letter of Development Policy for Irrigated Agriculture (Government letter dated May 31, 1999);
  - (d) agreement on a draft joint circular to be issued by the Ministries of Development and Environment, Interior and Hydraulics setting out minimum technical norms for irrigated schemes to be respected by users (May 19, 1999);
  - (e) commitment on the part of Government not to nominate staff, key to the implementation of the IDPIAM, without prior consent of the Bank (Government letter dated May 16, 1999);
  - (f) presentation of a draft Performance Contract for SONADER and agreement and changes to be introduced (Government letter dated May 18, 1999);
  - (g) adoption, by authorized authorities of UNCACEM, of an interest rate policy geared to ensuring its operational self-sufficiency by FY2000 and its financial self-sufficiency by the end of 2001, and presentation of a tentative budget showing the conditions for operational self-sufficiency for the year 2000 (UNCACEM's Board minutes of May 16, 1999);
  - (h) settlement by UNCACEM of its client accounts in accordance with its auditor's recommendations (Auditor's letter dated May 12, 1999);
  - (i) presentation of UNCACEM's audit report for fiscal years 1996 and 1997, and initiation of audit for 1998 (Auditor's letter dated May 12, 1999);
  - (j) adoption by UNCACEM of new Procedures Manual as required by the planned new banking instruments (UNCACEM's Board minutes of May 16, 1999); and
  - (k) presentation of a summary document describing the Monitoring/Evaluation system to be put in place for the project.

## ***G3. Agreement Reached at Negotiations***

110. During negotiations, it was agreed with the Borrower that:
- (a) six months after the effective date, the Borrower will have entered into a Performance Contract with SONADER, in form and substance acceptable to the Association;
  - (b) by December 31, 1999, the Borrower will have; (i) appointed, in UC-PDIAIM, a diversification coordinator, a marketing expert, a research and development expert, and an

agricultural expert; (ii) appointed a monitoring and evaluation expert in each of MDRE's regional centers in Boghe, Kaedi and Rosso to assist UC-PDIAIM in the collection of data, their dissemination and the coordination among entities involved in the agricultural sector in the Project Area; (iii) established CADI and nominate its members; (iv) established CIMOS and nominate its members; (v) established CP and nominate its members; and (vi) established CCD under the chairmanship of UC-PDIAIM and nominated its members; and

- (c) by July 31, 2000, the Borrower will have: (i) prepared and adopted regulation for the application of Decree No 98/48 of June 18, 1998 on public transport liberalization; (ii) carried out a time-bound action plan acceptable to the Association, designed to strengthen its financial management system for the Project and develop, not later than twenty-four months following the Effective Date, a system acceptable to the Association for the preparation of the financial management report, the physical Project implementation report and the Project procurement report.

111. It was also agreed that UNCACEM will have:

- (a) furnished to the Association, before July 31, 1999, a non-qualified audit report for its fiscal year 1998, undertaken by auditors acceptable to the Association;
- (b) appointed, before July 31, 1999, an independent auditor, acceptable to the Association, under terms of reference acceptable to the Association, for the purpose of auditing its accounts until the completion of the execution of the Project;
- (c) entered, before December 31, 1999, into an agreement with a consultant firm acceptable to the Association, for consultant services under the Project, in form and substance acceptable to the Association;
- (d) maintained at all times, until the completion of the execution of the Project qualified and experienced staff, acceptable to the Association, in the positions of director general and expert in charge of finances/accounting.
- (e) utilized all amounts received in repayment of agricultural credit provided under the Project to finance further agricultural projects undertaken by private and/or cooperative community customers in the Project Area

112. In addition, it was agreed with the Borrower that SONADER will have:

- (a) by July 31, 2000 initiated its reorganization in accordance with terms of reference and an action plan acceptable to the Association; and
- (b) by the time of the Midterm Review, subcontracted at least half of the monetary volume of services rendered, works executed, training delivered and supervision performed in the course of carrying out its part of the Project.

## **H. Readiness for Implementation**

Engineering design documents for first year's activities are complete and ready for the start of project implementation  Not applicable.

The procurement documents for the first year's activities are complete and ready for the start of project implementation.

The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.

[ ] the following items are lacking and are discussed under loan conditions (Section G):

**I. Compliance with Bank Policies**

[X] This project complies with all applicable Bank policies.

[X] The following exceptions to Bank policies are recommended for approval: The project complies with all other applicable Bank policies

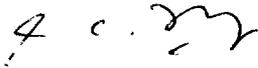


Task Team Leader: Abdelkrim Oka



Sector Manager/Director: Jean-Paul Chausse

Fu



Country Manager/Director: Hasan Tuluy

**PROGRAM AND PROJECT DESIGN SUMMARY**  
Mauritania: Integrated Development Project for Irrigated Agriculture

Summary Description	Key indicators	Means of verification	Critical conditions
<p align="center"><b><u>Overall CAS Objective</u></b></p> <p>"to assist Mauritania achieve a higher, sustainable and equitable growth, create employment and ... reduce poverty"</p> <p align="center"><b><u>Sector-related CAS Objective</u></b></p> <p>Support Mauritania's rural strategy which consists of: (i) diversifying agriculture, accelerating its growth and making it competitive; (ii) integrating the livestock sector into the economy; (iii) promoting employment and alleviate poverty; and (iv) reducing the degradation of the natural resource base.</p> <p align="center"><b><u>Program-linked CAS objective</u></b></p> <p>"Support the long-term investment program for the rehabilitation of irrigated agriculture and the establishment of basic rural infrastructures throughout the Senegal River Valley by means of the Integrated Development Program for Irrigated Agriculture (IDPIAM)".</p>	<ul style="list-style-type: none"> <li>• Improvement of human development indicators</li> <li>• Proportion of agricultural GDP in national GDP</li> <li>• Migration towards the capital</li> <li>• Volume of private sector investment in the Valley/volume of subsidies</li> <li>• Competitive supply of the products of irrigated agriculture on national and international markets</li> <li>• Number and percentage of smallholder beneficiaries</li> </ul>	<ul style="list-style-type: none"> <li>• Relationship to human development</li> <li>• National statistics</li> <li>• Macro-economic reports</li> </ul>	
<p align="center"><b><u>Program Development Objective</u></b></p> <p>Increase agricultural value-added, and the employment and incomes of populations living in the Senegal River Valley through judicious use of the most precious of this desert country's natural assets: the river's water and the arable land along the river valley.</p>	<ul style="list-style-type: none"> <li>• Overall agricultural growth: increase in total value added of agricultural production (annual average 7%)</li> <li>• Agricultural diversification: increase in the value-added of non-rice crops (annual average 10%)</li> <li>• Productivity: land and labor productivity increase</li> <li>• Economic return: improved competitiveness of the main crops</li> <li>• Poverty alleviation: reduction in the percentage of people below the poverty line in the targeted area (from 60% to 20%) by the end of the program</li> <li>• Enhanced food security: increased incomes and reduction of the gap between food demand and domestic food production</li> <li>• Access to land, water service and credit by the poor</li> <li>• Environmental sustainability: reducing water logging, salinity and waterborne illnesses</li> </ul>	<ul style="list-style-type: none"> <li>• Study of base-line social and environmental impact</li> <li>• Inventory of irrigated schemes</li> <li>• Thematic studies</li> <li>• Core IDPIAM M&amp;E</li> <li>• National statistics</li> <li>• Land-use map</li> <li>• OMVS report on water resource use</li> </ul>	<ul style="list-style-type: none"> <li>• Sustained commitment by Government to an appropriate economic policy, legal and institutional framework</li> <li>• Favorable world market conditions</li> <li>• Proper management of OMVS infrastructures</li> <li>• Adequate coordination of all projects in the Valley</li> <li>• Absence of major social conflict in the Valley</li> </ul>

**PROGRAM AND PROJECT DESIGN SUMMARY**  
Mauritania: Integrated Development Project for Irrigated Agriculture

Summary description	Key indicators	Means of verification	Critical conditions
<p style="text-align: center;"><b>Phase I - Development Objective</b></p> <p>Lay the foundation for a sustainable development of irrigated agriculture, in technical, financial, environmental standpoints and socioeconomic terms.</p>	<p style="text-align: center;"><b>Main Indicators</b></p> <ul style="list-style-type: none"> <li>• Continued absence of rice sector distortions, as a result of measures introduced in 1999</li> <li>• Implementation of regulations associated with Decree 98/48 and Bylaw R075 on transport sector liberalization</li> <li>• Satisfactory rate of repayment (at least 95%) of loans granted by UNCACEM.</li> <li>• Operational and financial self-sufficiency achieved by UNCACEM by 2001</li> <li>• Satisfactory level of eligible and fulfilled credit requests (at least 75% of irrigated scheme development objectives)</li> <li>• Credit for non-rice crops accessible to producers fulfilling credit conditions</li> <li>• Improved efficiency (volume of credit &amp; response time) of UNCACEM in providing credit to individuals and cooperatives</li> <li>• Improved efficiency of SONADER in accordance with criteria set out in Performance Contract</li> <li>• Awards of land use permits and temporary or permanent concessions are in accordance with applicable land tenure laws</li> <li>• Establishment of a transparent and accessible land registries allowing verification of land use permits and temporary/permanent titles</li> <li>• Transparency, equity and security of land tenure judged satisfactory, as determined by results of participatory surveys</li> <li>• Satisfactory access of poor families to agriculture services, as determined by results of participatory surveys</li> <li>• Economic return on Government-supported investments in irrigated schemes demonstrated satisfactorily on the basis of initially available results</li> <li>• Improved cost-benefit ratio for rice and new diversification crops on the basis of initial available results</li> <li>• Establishment of procedures for collecting water charges and fees for operation and maintenance (O&amp;M) of public infrastructure works</li> <li>• Completion of feasibility studies, including EIAs, for off-farm infrastructures (crucial for investments planned under Phase II)</li> </ul>	<ul style="list-style-type: none"> <li>• Official gazette</li> <li>• Policy implementation monitoring reports</li> <li>• UNCACEM statistics</li> <li>• SONADER statistics</li> <li>• Dossiers on rehabilitation of irrigated schemes</li> <li>• Annual balance sheets of irrigated schemes</li> <li>• Thematic studies</li> <li>• Report on diversification efforts</li> <li>• M&amp;E reports on various projects in the Valley</li> <li>• Beneficiary assessments</li> <li>• Base-line situation with regard to technical, managerial and organizational capacities of the irrigated schemes</li> <li>• IDPIAM's annual plan</li> <li>• Progress reports</li> <li>• Annual reports</li> </ul>	<ul style="list-style-type: none"> <li>• Dynamism and coordination of public and private institutions involved in the Valley</li> <li>• Dynamic process of developing a legal framework</li> <li>• Equitable and efficient credit procedures</li> <li>• Pricing and market arrangements not discriminating in favor of rice and against diversified crops.</li> <li>• Availability of qualified labor</li> <li>• Literate farmers</li> <li>• Organization of farmers</li> </ul>

**PROGRAM AND PROJECT DESIGN SUMMARY**  
Mauritania: Integrated Development Project for Irrigated Agriculture

Summary description	Key indicators	Means of verification	Critical conditions
	<p align="center"><b><u>Triggers for passage from Phase I to Phase II</u></b></p> <ul style="list-style-type: none"> <li>• Liberalization measures for agricultural markets and transport services, as agreed upon between the Government and IDA in the 1999-2002 PFP remain in place</li> <li>• UNCACEM has achieved operational and financial self-sufficient by 2001</li> <li>• Investment credit and subsidies are granted according to IDPIAM procedures</li> <li>• Awards of land use permits, temporary and permanent concessions are in conformity with land tenure regulations</li> <li>• Establishment of transparent and accessible land registries allowing verification of permits and temporary or permanent concessions</li> <li>• Procedures are established for the collection of water fees and O&amp;M charges for public infrastructure works</li> <li>• Economic return on Government-supported irrigation investments demonstrated satisfactorily</li> <li>• Performance of SONADER judged satisfactory according to criteria set out in Performance contract</li> </ul>	(See above)	

**PROGRAM AND PROJECT DESIGN SUMMARY**  
**Mauritania: Integrated Development Project for Irrigated Agriculture**

Summary description	Key indicators	Means of verification	Condition critique
<p align="center"><b><u>Phase II - Development Objective</u></b></p> <p>Consolidate accomplishments of Phase I and provide incentives and support to producers and investors to increase area of irrigated schemes to be rehabilitated, expanded or newly created.</p>	<p align="center"><b><u>Main indicators</u></b></p> <ul style="list-style-type: none"> <li>• Satisfactory access of poor families to agricultural services, as determined by results of participatory surveys</li> <li>• Satisfactory repayment rate (at least 95%) of credit granted by UNCACEM</li> <li>• Reimbursement by UNCACEM of IDA credit line granted by Government</li> <li>• Amount and collection of water fees and collective infrastructure charges judged adequate for maintenance of those infrastructures</li> <li>• Satisfactory management of collective infrastructures, based on technical assessments</li> <li>• Awards of land use permits and temporary or permanent concessions are in accordance with applicable land tenure laws</li> <li>• Transparent and accessible land registries are in place, allowing verification of land use permits, temporary concessions and permanent concessions</li> <li>• Satisfactory rate of rehabilitation/expansion/new creation (over 75% of targeted area)</li> <li>• Economic return on Government-supported diversification activities demonstrated satisfactorily on the basis of initial available results</li> <li>• Emergence and expansion (in number, jobs and income-generation) of new non-farm activities</li> </ul> <p align="center"><b><u>Triggers for passage from Phase II to Phase III</u></b></p> <ul style="list-style-type: none"> <li>• The favorable economic, legal and institutional environment created under Phase I is maintained and improved</li> <li>• UNCACEM's financial self-sufficiency is maintained</li> <li>• UNCACEM reimburses the IDA credit line extended by Government</li> <li>• Credit and investment subsidy are awarded in accordance with IDPIAM procedures</li> <li>• Awards of land use permits, temporary and permanent concessions are in conformity with land tenure regulations</li> <li>• Transparent and accessible land registries are in place, allowing verification of land use permits and temporary or permanent concessions</li> <li>• Amount and collection of water fees and collective infrastructure charges judged adequate to maintenance of those infrastructures</li> <li>• Economic return on Government-supported diversification activities demonstrated satisfactorily on the basis of available results</li> </ul>	<p>(See above)</p>	

**PROGRAM AND PROJECT DESIGN SUMMARY**  
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Summary description	Key indicators	Means of verification	Condition critique
<p align="center"><b><u>Phase III - Development Objective</u></b></p> <p>Achieve sustainability of irrigated schemes and production systems introduced during Phases I and II and apply the same to other irrigated schemes in the Valley.</p>	<p align="center"><b><u>Key indicators</u></b></p> <ul style="list-style-type: none"> <li>• Overall agricultural growth: increase in total value-added of agricultural production (at least 7% /annum)</li> <li>• Agricultural diversification: increase in value-added of non-rice crops (averaging 10%/annum)</li> <li>• Increased productivity: increased productivity of land and labor</li> <li>• Economic return: increased competitiveness of main crops</li> <li>• Poverty alleviation: reduction in percentage of the population living below poverty threshold in the target area (from 60% to 20%) by the end of the program.</li> <li>• Environment: reduction in waterlogging, salinity and waterborne diseases</li> <li>• Improved food security: increased incomes and reduction of disparity between consumption and domestic production</li> <li>• Access of poor populations to land, water, services and credit</li> <li>• UNCACEM reimburses IDA line of credit extended by Government in accordance with conditions of credit agreement</li> </ul>	<p align="center">(See above)</p>	

**PROGRAM AND PROJECT DESIGN SUMMARY**  
Mauritania: Integrated Development Project for Irrigated Agriculture

Summary description	Key indicators	Means of verification	Critical conditions
<p><b>Results of Phase I (output)</b></p> <p><i>A. Development of a sound policy, legal and institutional framework</i></p> <ul style="list-style-type: none"> <li>• Legal and regulatory texts are satisfactory and applied in the areas of import tariffs, transportation, land tenure, producer organizations, and management of water and the environment</li> <li>• Institutional capacities strengthened in the areas of credit (UNCACEM), policy and strategy, statistics, planning, internal controls and coordination (MDRE), support to producers (SONADER and private stakeholders)</li> </ul>	<ul style="list-style-type: none"> <li>• List of texts adopted and date</li> <li>• Number of monitoring reports on enforcement of regulations in these specific areas</li> <li>• Number of training sessions carried out to strengthen capacities of institutions, themes and number of beneficiaries by type of institution</li> <li>• Skill level of SONADER (number of farms monitored and frequency; level of cost recovery for management and maintenance; number of irrigated schemes transferred to users)</li> <li>• Skill level of UNCACEM (restructuring of staff; reduction in processing time for dossiers)</li> <li>• Roles and actual skills of MDRE (economic policy documents prepared/reviewed; analysis and dissemination of agricultural statistics; monitoring/evaluation documents for MDRF's projects)</li> </ul>	<ul style="list-style-type: none"> <li>• Official gazette</li> <li>• Policy implementation monitoring reports</li> <li>• UNCACEM statistics</li> <li>• SONADER statistics</li> <li>• M&amp;E reports on various projects in the Valley</li> <li>• Beneficiary assessments</li> <li>• Base-line situation with regard to technical, managerial and organizational capacities of the irrigated schemes</li> <li>• IDPIAM's annual plan</li> <li>• Progress reports</li> <li>• Annual reports</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity for monitoring implementation of existing policies</li> </ul>
<p><i>B. Development of basic infrastructures</i></p> <ul style="list-style-type: none"> <li>• Feasibility studies, RFP and DFS available and adequate for public infrastructures to be carried out under Phase II</li> <li>• Schemes rehabilitated, expanded and newly created</li> <li>• Results of R&amp;D on pumping systems, irrigation and drainage techniques</li> </ul>	<ul style="list-style-type: none"> <li>• List of studies and dates</li> <li>• Area and number of irrigated schemes rehabilitated by type of irrigated scheme (large collective, collective, individual, 40 ha +, individual &lt; 40 ha)</li> <li>• Time elapsed for processing of rehabilitation dossiers from receipt of request to sign-off on works</li> <li>• List of research results available on extension</li> <li>• Number and type of contract awarded, number and type of beneficiaries</li> </ul>	<ul style="list-style-type: none"> <li>• Rehabilitation requests</li> <li>• Dossiers on rehabilitation (technical, environmental, economic, managerial files)</li> <li>• Progress reports</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient and equitable financial intermediation</li> </ul>
<p><i>C. Support to farm management and organization</i></p> <ul style="list-style-type: none"> <li>• Skills strengthened in the areas of literacy, management, organization, supply, marketing, credit, partnerships, irrigated scheme and equipment maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Number and themes of training sessions – support provided to increase skills of farmers and their organizations, by type of irrigated scheme</li> <li>• Number of requests forwarded to fund for management</li> <li>• Number of beneficiaries of this training (men and women)</li> <li>• Number and types of service providers serving producers</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnosis of needs</li> <li>• Reports on assisted self-assessments</li> <li>• Training programs</li> </ul>	<ul style="list-style-type: none"> <li>• Coordination capacity of public and private participants in support of management and organization</li> </ul>

**PROGRAM AND PROJECT DESIGN SUMMARY**  
Mauritania: Integrated Development Project for Irrigated Agriculture

Summary description	Key indicators	Means of verification	Critical conditions
<p><b>Operational results of Phase I (output)</b></p> <p><i>D. Support to traditional crops subsector</i></p> <ul style="list-style-type: none"> <li>• Skills improved for producers and extension agents in the areas of production, storage, processing, conservation techniques and intermediate mechanization</li> <li>• Availability of high quality seed</li> <li>• Functional rice quality monitoring system</li> <li>• Information systems on rice prices, markets and inputs and use of the systems by producers for decision-making</li> </ul>	<ul style="list-style-type: none"> <li>• Number and themes of producer training sessions carried out, by type of irrigated scheme</li> <li>• Number and themes of extension agent training sessions carried out, and number of beneficiaries (men and women)</li> <li>• Level of production and yield, by type of irrigated scheme and crop</li> <li>• Quantity of high quality seed produced and used</li> <li>• Number of markets using established quality norms</li> <li>• Rate of dissemination of information on prices and markets by type of user</li> <li>• Volume of credit and rate of repayment by type of irrigated scheme</li> </ul>	<ul style="list-style-type: none"> <li>• Annual work programs of participants</li> <li>• Progress reports</li> <li>• Annual balance sheets</li> <li>• Thematic studies</li> <li>• UNCACEM Statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate transport and marketing policy</li> </ul>
<p><i>E. Diversification Promotion</i></p> <ul style="list-style-type: none"> <li>• Diversification products tested and proved promising</li> <li>• Professionalization of diversification subsectors (identification of opportunities, planning and evaluation, problem resolution, management of logistical and commercial groupings, continuity of marketing ties)</li> <li>• Operational pest control services at ports and airports</li> <li>• Operational logistical and refrigeration infrastructures</li> <li>• Existence of a database on market data and comparators for products developed</li> </ul>	<ul style="list-style-type: none"> <li>• Area brought under diversification production , by type of irrigated scheme</li> <li>• Number and type of opportunities identified on local and export markets and specifications of comparator products</li> <li>• Number of market tests carried out, number judged promising, and number of comparator products identified from these tests .</li> <li>• Number and type of operational participants by level in commodity subsectors (upstream, production, downstream)</li> <li>• Level of public and private investment by activity within a commodity subsector</li> <li>• Time elapsed for processing of dossiers on pilot diversification activities</li> <li>• Number and type of public and private infrastructures</li> </ul>	<ul style="list-style-type: none"> <li>• Annual work programs</li> <li>• Market studies</li> <li>• Progress reports</li> <li>• Annual balance sheets</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate fiscal and tariff policy</li> <li>• Appropriate transport policy</li> </ul>
<p><i>F. Environmental impact mitigation measures</i></p> <ul style="list-style-type: none"> <li>• Environmental observatory operational</li> <li>• Land use plan</li> <li>• Environmental norms adopted and followed</li> <li>• Mitigation measures carried out (tree planting, socio-collective facilities, health monitoring), etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Geophysical database on the state of the environment available and updated</li> <li>• Number of training sessions carried out and themes, types of beneficiaries</li> <li>• Area or region covered by land use plan</li> <li>• List of environmental norms adopted and % of irrigated schemes applying these norms</li> <li>• List of measures carried out and number thereof, number of beneficiaries</li> </ul>	<ul style="list-style-type: none"> <li>• Annual activity program</li> <li>• Progress reports</li> <li>• Annual balance sheets</li> <li>• Land use plan</li> <li>• Official gazette</li> </ul>	

**PROGRAM AND PROJECT DESIGN SUMMARY**  
Mauritania: Integrated Development Project for Irrigated Agriculture

Summary description	Key indicators	Means of verification	Critical conditions
<p><b><u>Operational Results of Phase I (output)</u></b></p> <p><i>G. Project management and monitoring &amp; evaluation</i></p>	<ul style="list-style-type: none"> <li>• Database functioning, up-to-date and used for management and decision-making under IDPIAM</li> <li>• Number of consultation meetings involving participants in the Valley, type of regular participant</li> <li>• Number and type of beneficiary of subsidy and volume of subsidy handled by type of funding</li> <li>• Response time to problems encountered</li> <li>• Physical implementation rate by component and by activity</li> <li>• Rate of disbursement by component and by expenditure category</li> <li>• % contribution by beneficiaries</li> <li>• Volume of procurement (contracts, <i>conventions</i>) and types of beneficiaries</li> </ul>	<ul style="list-style-type: none"> <li>• IDPIAM's technical and financial reports</li> <li>• M &amp; E d'base</li> <li>• Market data d'base</li> <li>• Financial data d'base</li> </ul>	

**PROGRAM AND PROJECT DESIGN SUMMARY**  
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Summary description	Key indicators	Means of verification	Critical conditions
<b>Components/Activities of Phase I</b>			
<b>A. Development of a sound policy, legal and institutional framework</b> <ul style="list-style-type: none"> <li>• Study, adoption, dissemination and monitoring of application of favorable policies (credit, marketing, transport, management of public infrastructures, environment, producers' organizations)</li> <li>• Strengthening of institutional capacities (MDRE, UNCACEM, SONADER)</li> </ul>	<b>Costs:</b> (x000 dollars) <b>3,736</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual activity programs</li> <li>• Technical and financial progress reports</li> <li>• M &amp; E reports</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity of participants to plan, monitor and evaluate their activities</li> <li>• Stability of staff</li> </ul>
	742		
	2,994		
<b>B. Development of basic infrastructures</b> <ul style="list-style-type: none"> <li>• Feasibility studies of public infrastructures</li> <li>• Rehabilitation, extension, creation of collective and individual irrigated schemes</li> <li>• Research &amp; development of irrigation, pumping and drainage techniques</li> </ul>	<b>13,116</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual activity program</li> <li>• Dossiers on rehabilitation requests</li> <li>• Technical and financial progress reports</li> <li>• M &amp; E reports</li> </ul>	
	1,626		
	9,438		
	2,052		
<b>C. Support to farm management and organization</b> <ul style="list-style-type: none"> <li>• Diagnosis, training and monitoring of managerial and organizational capacities</li> </ul>	<b>1,108</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual activity programs</li> <li>• Dossiers on funding requests</li> <li>• Technical and financial progress reports</li> <li>• M &amp; E reports</li> </ul>	<ul style="list-style-type: none"> <li>• Competence of support services and adequate coordination</li> </ul>
<b>D. Support to traditional crops subsector</b> <ul style="list-style-type: none"> <li>• Research and extension</li> <li>• Financial support to traditional crops</li> <li>• Training and study trips for producers and extension agents</li> <li>• Information system of rice prices, markets and inputs</li> <li>• Rice quality control</li> </ul>	<b>11,700</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual work programs</li> <li>• Dossiers on funding requests</li> <li>• Technical and financial progress reports</li> <li>• M&amp;E reports</li> </ul>	
<b>E. Diversification promotion</b> <ul style="list-style-type: none"> <li>• Development of infrastructure</li> <li>• Diversification promotion antenna</li> <li>• Diversification promotion activities</li> <li>• Quality control</li> </ul>	<b>8,072</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual work programs</li> <li>• Dossiers on funding requests</li> <li>• Technical and financial progress reports</li> <li>• M&amp;E reports</li> </ul>	
	2,770		
	2,803		
	2,390		
	109		
<b>F. Environmental impact mitigation measures</b> <ul style="list-style-type: none"> <li>• Environmental monitoring/evaluation</li> <li>• Land use plan</li> <li>• Development of norms</li> <li>• Environmental impact mitigation measures</li> </ul>	<b>3,141</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual work programs</li> <li>• Dossiers on funding requests</li> <li>• Technical and financial progress reports</li> <li>• M&amp;E reports</li> </ul>	
	1,069		
	722		
	1,302		
<b>G. Project management and monitoring &amp; evaluation</b> <ul style="list-style-type: none"> <li>• Management of matching grants</li> <li>• Coordination of IDPIAM activities</li> <li>• Administrative and financial management</li> <li>• Supervision M&amp;E</li> </ul>	<b>3,852</b>	<ul style="list-style-type: none"> <li>• Procedures manual</li> <li>• Annual activity program</li> <li>• Annual technical and financial progress reports</li> <li>• Audit</li> </ul>	<ul style="list-style-type: none"> <li>• Competent project staff (technically and managerially)</li> <li>• Stability of project staff</li> </ul>
	2,916		
	936		

**Component A: DEVELOPMENT OF A SOUND POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK**

Mauritania: Integrated Development Project for Irrigated Agriculture

(US\$ 3.736 million)

**A. Improvement of the economic policy and legal framework (US\$ 0.742 million)**

1. Mauritania has established a relatively favorable economic and legal environment for the implementation of a program such as IDPIAM, namely: (i) a national development strategy; and (ii) a Rural Development Strategy (RDS) presented to the Consultative Group in Paris in March 1998; (iii) a ten-year development policy for irrigated agriculture prepared in 1995 and revised in 1999 in the form of a Letter of Development Policy for Irrigated Agriculture (LDPIA); (iv) a policy of government disengagement and promotion of the private sector; (v) a transport liberalization policy; (vi) a tariff and market policy aimed at liberalizing trade; (vii) a policy of liberalization of foreign exchange rates; and (viii) a land tenure legislation allowing the regulation of land attribution in the irrigable areas. This legislation and some of these policies still need to be effectively enforced, however, and others require adaptation. Also, regular monitoring of the implementation of these legislation and policies is required over the course of the IDPIAM. Funds will be made available under IDPIAM to facilitate these activities.

**Agricultural tariffs**

2. The aggregate tax rate imposed on the principal type of imported rice increased from 41 percent to 47 percent from 1997 to 1998. While import duty for broken rice was reduced from 30 percent to 25 percent, value added tax (VAT) increased from 5 percent to 14 percent. Under the 1999-2002 Policy Framework Paper (PFP), the Government committed itself to applying a maximum of 23 percent of cumulative tariffs, including statistical taxes, retaining a single VAT rate, which will be applied to imported as well as local rice. Mauritania is also committed to bringing its tariff regime into line with that of other countries in the region. Since those countries do not apply any VAT or FMI to basic staples such as rice, Mauritania is expected to eventually follow suit.

**Liberalization of rice marketing**

3. Current arrangements in rice marketing, namely: (i) the determination of a producer price; (ii) guaranteeing the purchase of local rice by importers by asking them to also buy a portion of domestic rice production; and (iii) the establishment of a system of marketing subsidies, result in poor public resource allocation, and lack of incentives for farmers to invest in crop diversification. Liberalization of local rice marketing is consistent with the Government's intention to refrain from market intervention. As stated in its Letter of Development Policy for Irrigated Agriculture, starting with the 1999-2000 harvest season, the Government will: (a) no longer subsidize the interest rate on loans for local rice marketing; (b) avoid intervening in the determination of domestic paddy prices; and (c) guarantee that private importers will not be forced to buy a quota of local rice in order to import rice. In support of this policy, IDPIAM funds will be available for accompanying measures (consultants' services, studies, seminars, etc.)

**Transportation**

4. Until recently, a monopoly on road transport services was held by the *Fédération nationale des transports* (FNT), which determined transport charges and decided on the choice of transporters. Public authorities protected this monopoly by monitoring road traffic and checking that transporters had an FNT permit. This system discouraged the specialization of modes of transport (livestock trucks vs. grain trucks, for example) and did not allow for competition, which results in better quality transport and more

reasonable prices. The situation was therefore not conducive to the development of a dynamic and diversified agricultural sector.

5. In June 1998, the Government issued a decree (No 98/48 dated June 18, 1998) on the liberalization of public transport opening up this activity to competition and authorizing transporters to belong to the associations of their choice. The Government has made a commitment under the 1999-2002 PFP to implement decree No. 98/48 and *Arrêté* R075 to effectively liberalize transport services. Under the IDPIAM, the following activities will be undertaken: (i) monitoring of the enforcement of this regulation; (ii) a study of commercial transportation needs in the Valley emerging from the growth of agricultural activity; and (iii) an assessment of the financial resources (credit) to be made available to promote the organization and equipment of local transport associations or cooperatives in the Valley.

#### **Farmers' organizations**

6. Current legislation on socio-professional organizations does not give adequate latitude to farmers and other socioeconomic groups to organize themselves to serve their own interests and facilitate credit access. During Phase I of the program, the Government will carry out a review and overhaul of this legislation.

#### **Land tenure**

7. Mauritania's land tenure law rests mainly on Ordinance 83-127 dated June 5, 1983, concerning the reorganization of tenure and registry, and its accompanying enforcement text, Decree N° 90-020 dated January 31, 1990. This decree sets out the conditions under which any Mauritanian citizen can gain access to rural land ownership. However, definitive property transfer to individuals can occur only after ten years of continuous land exploitation. During this period, the requestor first obtains a land use permit, then a temporary concession and, finally, a permanent concession, leading to land titling conferring ownership rights. Land exploitation must be complete and permanent for it to result, 10 years after obtaining the land use permit, in permanent concession and then in ownership of property that one can freely sell, exchange or give away.

8. An analysis of the current legislation has concluded that the legal framework regulating land ownership in Mauritania is not an obstacle to the implementation of the IDPIAM as long as program beneficiaries have valid documents (land use permits, temporary or permanent concessions) documenting their rights. Also, the IDPIAM in itself cannot be the cause of land tenure problems or conflicts since the mechanisms already in place to prevent such conflicts and protect smallholders have proven more or less effective. Legal arrangements concerning conflict arbitration, as well as various circulars issued by the Ministry of the Interior on guarantees given to resident communities, make it possible to prevent (and resolve, if necessary) any problems arising from the assignment of parcels for agricultural use, and in particular those conflicts resulting from encroachment on the living space of rural settlements and on potential community land reserves.

9. Based on the initial conclusions of the land tenure study<sup>1</sup> carried out in 1999, the following activities will be carried out during Phase I of the IDPIAM:

- establishment of a surveillance mechanism intended to foretell conflicts that would inevitably arise from changes in the agricultural sector and in the irrigated subsector in particular, and to

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<sup>1</sup> Study aimed at creating an inventory of land tenure regularization and land registry operations in Mauritania from 1990 to 1997 and the development of an action program for 1998-2002.

monitor the efforts of the administrations charged with managing land tenure, at least in the main districts (*mounghataa*) of the Senegal River Valley;

- a study designed to assess the advantages, disadvantages and modes of application of an agricultural land tax;
- a study on the establishment of a progressive tax regime intended to incite landowners into developing their lands and, thus, to discourage deliberate and speculative fallow periods;
- a study of the possibilities, advantages and disadvantages of limiting individual agricultural land size ownership;
- preparation and issuance of a joint circular by the Ministries of Interior and Finance defining the procedures for transferring property and the conditions for registering individual property rights;
- preparation and issuance of a joint circular by the Ministries of Rural Development and the Interior defining the administrative procedures for verifying land rights that have not been permanently assigned, so as to avoid fraudulent maneuvers that could be detrimental to the agricultural credit institution; and
- a preliminary study on the importance of current informal rural land market, as well as on its winners and losers. This study will also shed light on the economic and social consequences of this market.

#### **Norms for design and implementation of irrigated schemes**

10. In order to ensure that the best irrigated lands are developed with a view to sustainable use, the Government will require that all lands assigned by the State in the Valley be developed in accordance with norms consistent with the preservation of national assets to which the State and the donor community have devoted huge investments, especially for the Diama and Manantali dams. To this end, MDRE's Circular No. 008 (1993) establishing norms for developing irrigated schemes in the Valley will be replaced by a joint circular issued by the Ministries of Rural Development and Environment, Interior and Hydraulics establishing minimum technical norms to be respected by the developers of irrigated schemes before they progress to the stage of temporary or permanent concessions. This joint circular will be an updated version of MDRE's Circular No. 008. Under IDPIAM, MDRE will receive help in disseminating this new circular and in training the staff charged with its enforcement.

#### **Export and trade facilitation**

11. Phase I of the program provides an opportunity to assess the scope of measures needed to facilitate export and trade, with a view to implementing needed reforms in support of the large-scale export activities envisaged under Phase II. This assessment, as well as the development of a reform program, will be carried out with IDPIAM funding in the form of studies, consultants' services, seminars, communications, and publications.

## **B Capacity building (US\$ 2,944 million)**

12. Despite their long management records, MDRE, SONADER and UNCACEM need to improve their managerial skills. The development and strengthening of skills within MDRE and SONADER is planned under the Agricultural Services Project. Some support activities crucial to the implementation of IDPIAM will be financed under that project.

### ***MDRE***

13. Emphasis will be on the newly created Directorate for Policy and Monitoring/Evaluation (DPSE). This directorate is responsible for policy making, monitoring and evaluation of policy implementation, and of programs and projects, and for coordination within MDRE, between MDRE and its agencies (such as SONADER), and among MDRE, other ministries and donors. The focus will be on training DPSE staff and on developing a monitoring/evaluation system and effective tools for collecting and processing the data needed for the M & E function.

14. Prior to implementation of Phase I of the IDPIAM, staffing needs and required staff qualifications will be identified. At the start of the IDPIAM, staff will be hired, their training programs defined and their training initiated. A study will be carried out to design the monitoring/evaluation system to be set up within DPSE. The system will be in place before the end of Year 2 of the IDPIAM.

15. The capacity of collecting, processing and analyzing agro-pastoral data needs to be strengthened. A study of existing information systems confirmed this need and recommended the creation of a system (SIAP: *Système d'informations agro-pastorales*) whose objectives would be: (i) updating statistical tools (sampling base, agro-pastoral typology, etc.); (ii) designing and carrying out periodic agro-pastoral surveys; (iii) improving data management and strengthening the analysis of agro-pastoral data; (iv) improving coordination between producers and the users of statistical data; and (v) strengthening institutional capacity (restructuring of the statistics service – SSP – and improvement of its technical and logistical capacities). The new system will be set up in three phases implemented over a period of ten years: (a) preparation of statistical instruments and restructuring of SSP; (b) establishment of an agricultural inventory and revision of the sampling base for other rural surveys; and (c) reforming the system of agro-pastoral statistics. It is crucially important to maintain a basic system of reliable data, not only as a tool for measuring and assessing the impact of agricultural policy, but also as a point of reference for the IDPIAM's M&E system. For this reason, the IDPAIM will participate in this initiative by financing (i) two agro-pastoral surveys over two years; (ii) the preparation (finalization of the sampling methodology) for the market gardening survey; (iii) the follow-up survey of livestock markets and agricultural production; and (iv) the establishment of operating accounts. The analysis of agro-pastoral data and their use in developing policies and programs for agriculture and livestock will also be supported by IDPIAM. These activities will be carried out by MDRE's Directorate for Policy and Monitoring/Evaluation, in close collaboration with the *Office national de la statistique (ONS)*. It is expected that the SIAP initiated in the context of the household and agro-pastoralists survey in 1999 will be gradually taken over by and run by the DPSE.

### **SONADER**

16. SONADER is a so-called EPIC (*Etablissement public à caractère industriel et commercial*) as defined by a law dating from 1990. It is one of MDRE's important operators and, under the terms of a triennial performance contract, handles the following three tasks: (i) delegated works contractor for hydro-agricultural investments; (ii) management of State-supported public infrastructures; and (iii) advising farmers and their groups. Under IDPIAM, SONADER will carry out the following: (i)

delegated works contracting for studies and basic infrastructures included in the program; (ii) assistance to UNCACEM and MDRE for the monitoring and supervision of studies and irrigated schemes rehabilitation work; and (iii) support to producers in the areas of techniques and farm management.

17. SONADER, which is to play a key role in implementing the IDPIAM, has problems of excess staffing and financial deficits. In addition, its financial management system is outdated. SONADER's deficit is due to its excess staff and to the fact that it performs several tasks on behalf of the Government, but for which it is only partially remunerated. The tasks in question are some that have been included in donor-financed projects, were supposed to continue after project's end and the donor's withdrawal, but for which the State has not mobilized the necessary funds required to take them over.

18. The draft of the new performance contract for 1999-2002, submitted to IDA as a condition of negotiations of the IDPIAM and currently under approval, proposes a sound model of intervention and management for SONADER. A restructuring study of SONADER will also begin at the start of the project and will be completed during the first semester. This study's recommendations will deal with strengthening SONADER's skills and profitability, and will also address the following needs:

- support for the voluntary departure of about 80 agents;
- an internal training plan to improve staff skills and redeployment; and
- support for an updated management system (consultants' services, procedures, materiel and software).

#### UNCACEM

19. UNCACEM currently receives long-term technical assistance financed respectively by the *Agence française de développement* through 1999 (one technical assistant) and the German GTZ through 2000 (one full-time technical assistant, plus 20 man-months of ad hoc technical assistance and computer and cartographic equipment.) At present, UNCACEM is not slated to receive any institutional support beyond 2000.

20. The institutional assessment performed during project preparation revealed the following: (a) a need to improve management tools (absence of cash management, internal controls, budget monitoring/control, integrated portfolio monitoring), and UNCACEM's managerial capacity in order to make them compatible with the planned development program; (b) great needs in the areas of staff training and human resource management; (c) excessive dependence upon permanent technical assistance for day-to-day management, which requires a strengthening of the internal capacity for strategic planning, technical monitoring, management and control.

21. In order to remedy these inadequacies, support UNCACEM in the development of the planned new products and foster the institution's growth, technical assistance will be provided to UNCACEM under the PDIAIM Phase I by a consulting firm recruited through international competitive bidding.

22. Terms of reference for this technical assistance will be as follows:

- support to UNCACEM in drawing up a human resources development plan (Year 1): inventory of available resources and needs for such a development program, job definitions, identification training and recruitment needs, development of an operational training program (two man-months);
- establishment or improvement of management tools and monitoring of implementation: synoptic performance charts, cash management, budget monitoring, monitoring of the

portfolio and of high-risk clients; establishment of an internal control and inspection function; creation of a plan for greater computerization. The establishment or improvement of management tools will need to occur during the first year, with monitoring of implementation following during the following years (4 man-months);

- development of a training plan: (100 man-months of training (on the job), requiring 10 man-months of trainers' time) including the following:
  - \* training of credit agents (new products, criteria for project evaluation, economic and financial analysis of projects, initiation to irrigated perimeter development, monitoring and control of projects, cooperative organizations and the participatory approach, etc.) This training will be open to employees of interested commercial banks, so as to lay the groundwork for, and facilitate, their interventions in the rural sector during the program's subsequent phases;
  - \* training of managerial and administrative staff (management methods, internal controls, inspection, etc.);
  - \* training for administrators (mutual credit, risk management, project evaluation criteria, principles of bank management, etc.); and
  - \* training of stockholders.
- *support for the introduction of new products* (diversification loans, irrigated scheme development loans, marketing loans: introduction of defined procedures and practical modes of processing credit dossiers; systematic follow-up (during the first year), and then more selective follow-up of (over subsequent years) of the processing of dossiers dealing with the new products (5 man-months)
- ad hoc support for evaluating the feasibility of very technically specialized projects (3 man-months).

23. The human resources to be deployed total about 24 man-months. Technical assistance will need to be contracted on the basis of Bank-approved terms of reference. The expected duration of the technical assistance contract is three years, a period corresponding to the duration of Phase I. This assistance will not be full time during these three years but on a declining basis and will not be used as a replacement for UNCACEM regular staff. In addition, IDPIAM will finance the acquisition of additional computer equipment for UNCACEM.

#### **Donor Coordination**

24. Since the MDRE, SONADER and UNCACEM are receiving support from several donors under several projects, there will be an effort at coordination to ensure that capacity building is adequately supported. All activities will also be coordinated with other donors to help ease and streamline the institutional environment and the operating procedures of these institutions.

**Component B: DEVELOPMENT OF BASIC INFRASTRUCTURES**  
Mauritania: Integrated Development Project for Irrigated Agriculture  
(US\$ 13.116 million)

**A. Public Infrastructures (1.626 million)**

1. Over 11 years, the IDPIAM will finance (a) the construction of basic hydraulic infrastructures facilitating access to water and the drainage of irrigated schemes; (b) the construction or repair of roads and access roads to the irrigated schemes; and (c) general studies in anticipation of future investments.

2. Under Phase I, the IDPIAM will finance: (a) the prior studies for the basic infrastructures mentioned above up to the detailed project designs (DPD) and the preparation of bidding documents; (b) the construction of crossings and small bridges on the itinerary of the future roads to be built in Phase II in the area of Gani-Dar El Barka; and, (c) terms of reference for the general studies. Thus, with the exception of the bridge works around Gani-Dar El Barka, structural infrastructure works are scheduled for Phase II. A maintenance policy for these infrastructures requiring user participation was drawn up during project preparation and will be put in place under Phase II.

**a) Hydraulic infrastructures**

3. Basic hydraulic infrastructures will be provided to facilitate access to water and the drainage of irrigated schemes in the Gani-Dar El Barka area, between the cities of Rosso and Boghé, as well as in the Gorgol Valley, since these two areas are the only ones where there are schemes under production and where such infrastructures are nonexistent and not planned to be constructed under other donor financing.

4. Hydraulic infrastructures around Gani-Dar El Barka will include: (i) construction of two water control installations and the excavation of a drainage collector to improve the current situation; (ii) construction of a dike and a water control installation to improve existing flood-recession crops on 900 ha; and (iii) the regrading of 4 marshes to allow for future expansion. Only DPDs and the preparation of bidding documents will be financed under IDPIAM's Phase I.

5. Hydraulic infrastructures in the Gorgol Valley will be determined under a master plan that will propose an optimal distribution of available water amongst the various existing (and potential) irrigated schemes. Only the master plan, the detailed feasibility and the preparation of the bidding documents will be financed under IDPIAM's Phase I.

**b) Roads and tracks**

6. The IDPIAM will finance the construction of access tracks for the irrigated schemes in the Gani-Dar El Barka area, as well as the bridges on the Kaédi-M'Bout access road leading into the Gorgol Valley and to the irrigated schemes at Foum Gleita.

7. Under Phase I, the IDPIAM will finance the construction of small bridgeworks and crossings on these tracks, including five bridges over large marshes and 22 crossing over smaller marshes. The tracks themselves will be financed under subsequent Phase II, on the basis of detailed studies. Feasibility studies for the repair of the small bridges/overpasses on the existing Kaédi-M'Bout laterite road will be financed under Phase I.

**c) General studies**

8. For purposes of long-term planning, even beyond the program's Phase III, the IDPIAM will finance master studies of water consumption by hydraulic infrastructures and an update of the master plan for the use of Senegal River water, based on the management directives defined by OMVS. Under Phase I, the IDPIAM will finance the production of terms of reference for these studies.

**B. Rehabilitation, expansion and creation of irrigated schemes (US\$ 9.438 million)**

9. Most individual Irrigated schemes financed by the private sector in Mauritania have serious technical deficiencies that make them unprofitable under current conditions. This is obvious from their rate of abandonment, which approaches 50 percent.

- Hastily designed and sloppily built, their technical characteristics prevent them from being physically and economically sustainable: canals are not compacted, which leads to operation and maintenance problems, and pumping equipment is of low yield.
- Individual irrigated schemes have often been created on soils ill-suited to the proposed crops (too sandy for rice, or too compact for diversified crops), and irrigation currently practiced (by flooding) does not allow for double culture because it is suitable for rice, but not for other crops.
- Soils and aquifers in the Delta are saline, and in the absence of adequate drainage, this salinity lowers paddy yields by 1 ton/ha; the waters of the Senegal River are slightly alkaline, leading to long-term risks for the soils in the Middle and Upper Valley.

10. The collective irrigated schemes generally, better designed and constructed than individual schemes, thanks to Government technical and financial assistance, suffer from lack of subsequent repair and maintenance leading to their progressive degradation.

11. Since the development of new large schemes is too costly (about US\$ 12,000/ha), the IDPIAM will essentially focus on the rehabilitation and/or extension of existing schemes. The development of new collective village schemes for rice production which could be considered for financing by other donors in the context of poverty alleviation as long as these investments, will adhere to the general principles of the IDPIAM as a whole: demonstrated economic return; beneficiary participation in the creation of these infrastructures; investment credit, and matching grants (complementary subsidy) calculated on the basis of predicted cash flow of agricultural revenues. The Government will require IDA's prior approval for the development of these schemes.

12. The rehabilitation/extension of existing schemes consists of: (a) rehabilitating and securing existing irrigation networks to make them more sustainable (compacting of main canals, leveling) and providing pumping equipment better suited to the new water levels behind the Diama dam; (b) installation of a drainage system to limit salinization problems; (c) expansion of irrigated areas of collective schemes where farmer's plots are too small. The creation of new schemes under IDA funding will be restricted to small pilots schemes targeting crop diversification. Works will be performed in accordance with norms, including environmental norms, defined by the Government and approved by IDA.

13. The rehabilitation/extension of existing schemes and the development of new ones will be carried out at the request of individual or collective farmers throughout the Valley, in accordance with procedures allowing them to choose investments based on their ability to implement them, to participate in their construction, and to repay loans they will have taken out. The implementation of this component will

therefore be accompanied by a training program intended for public servants, as well as for consultants, dealing with participatory project design. The ultimate goal, by the end of Phase III of the IDPIAM, is the financing of about 11,000 ha of rehabilitation/extension of irrigated schemes, mainly for rice, and about 2,000 ha of new schemes for diversified crops.

14. Phase I of the IDPIAM will be devoted mainly to: (i) creating an enabling and inciting framework; (ii) financing the rehabilitation/extension of a first tranche of 3,000 ha of existing schemes; and (iii) financing 100 ha of new schemes for diversification. The 3,000 ha will be distributed as follows:

- 1,000 ha of schemes belong to collectives (rehabilitation and/or extensions);
- 1,000 ha of schemes belonging to individual farmers owning less than 40 ha (rehabilitation);
- 1,000 ha of schemes belonging to individual farmers owning more than 40 ha (rehabilitation).

### **C. Research and Development (US\$ 2.052 million)**

15. In order to better utilize available water and land, three research and development (R & D) and testing themes are envisaged:

- improvement of existing pumping systems and introduction of new equipment in order to reduce pumping costs for irrigated rice in the Delta by at least 20 percent;
- testing of farmer's acceptance of techniques for draining and lowering salinity that are to be developed by researchers; and
- testing of new low-cost irrigation equipment and monitoring of existing equipment used by farmers.

16. During Phase I, R&D activities will be carried out with individual or collective farmers. Incremental investments or operating costs attributable to the new techniques will be supported under the IDPIAM, as well as the cost of monitoring and evaluation. The cost of short-term training and visits for researchers will also be one by IDPIAM. Given the newness of the proposed techniques, the program, which will be carried out by CNRADA, will receive external technical support from CIRAD under the PSI-CORAF program and from the West Africa Rice Development Association (WARDA) for drainage tests. The R & D program began under the Agricultural Services Project and will continue under Phase I (and Phase II if required) of the IDPIAM.

## **Component C: SUPPORT TO FARM MANAGEMENT AND ORGANIZATION**

Mauritania: Integrated Development Project for Irrigated Agriculture

(US\$1.108 million)

1. Support to farm management and organization has two components: (a) support to collective farmers, especially to grassroots farmer's cooperatives, classified as OSPs (*organisations socioprofessionnelles*) and their federations; and (b) support to individual producers.

### **A. Support to Collective Farm Management and Organization**

2. The State's disengagement, particularly under the AGSECAL, from certain functions upstream and downstream of production (input supply, credit, marketing) and from the management of collective irrigated schemes has not always been accompanied by the strengthening of producers' organizations, which are now called upon to assume several of these functions alone. Some of these organizations are, so weak that they have ceased organizing production activities on the irrigated schemes.

3. It is, therefore, crucial to strengthen producers' organizations if agricultural production is to be revitalized in the Valley under the IDPIAM. The plan is to ensure that OSPs get the training and counseling they need in the areas of organization and management of input supply, inventory credit, marketing as well as in the area of literacy, so that they have all the skills needed to fully assume their roles. Experience has shown that these improvements can only be sustained if producers and their organizations assume ownership and become the main doers and decision-makers. This is why the approach used to support OSPs will be participatory.

4. The goal assigned to the agricultural services under IDPIAM is to help producers' organizations to organize themselves enough to handle all their collective functions efficiently.

### **Diagnostic analysis of OSPs**

5. An analysis of the organizational status of all OSPs in the Valley will be carried out using, among other techniques, the "OSP satisfaction grid" developed by SONADER (Société nationale de développement rural) and ACOPAM (*Appui associatif et coopératif aux initiatives de développement à la base*) at Foum-Gleita. This exhaustive analysis will provide data on the baseline situation of producers' organizations and will constitute the foundation for the IDPIAM's monitoring and evaluation (M&E) system.

### **Improving the status of OSPs**

6. Certain aspects of the legislation dealing with cooperatives (OSP) status and its enforcement do not appear particularly suited to the current context. Some examples of this include: the heavy involvement of umbrella ministries in the entire decision-making process of cooperatives; the fact that the legislation does not allow a village to have more than one cooperative for the same purpose; and the excessively long process for cooperative recognition. These shortcomings, in addition to making strict enforcement of the legislation impossible in the field, run counter to the participatory spirit that is desired in the context of supporting OSPs. Under Phase I of the IDPIAM, a consultation on the non-operational aspects of the legal texts on cooperatives will be carried out. The texts will then be modified as needed.

## **Training of OSPs**

7. Training of OSPs for (a) organization, (b) management, (c) literacy and (d) operation and maintenance (O&M) of irrigated schemes and equipment will be carried out during the first year (1999). The beneficiaries will be 150 grassroots farmers' organizations in the project area. Specific help will be provided to the three federating organizations at the large schemes of Foum-Gleita, Kaédi and Boghé, as well as to the Union of Lexeiba and the Union of Women's Cooperatives at Tekane. This program will be gradually expanded to other producers' organizations, covering all OSPs in the Valley by the end of Phase I of the IDPIAM.

8. **Functional literacy.** The functional literacy of the representatives of the organizations to be supported by the program is an important factor in the OSPs' assumption of ownership of all the management tools. It will enable organizations' members to read and use the appropriate management manuals and other documents. Methodological documents have already been developed by ACOPAM in this area. They will be tailored to each zone and used for functional literacy training. Government and non-governmental organizations (NGO) with experience in this field, such as the State Secretariat for Literacy, the Rural Producers' Training Center (CFPR) and ACOPAM, will be called upon, to implement the programs.

9. **Management training.** This component will deal with the training of OSP personnel to maintain and use, in local languages, accounting and management documentation: receipts, stock inventories, expenditure records, financial statements, credit monitoring files, records on pump maintenance and on the maintenance of other agricultural equipment (tractors, harvesters).

10. **Organizational training.** In the area of organization, members of OSPs will be familiarized with the regulatory framework that controls their organization through training sessions dealing with the legislation on cooperatives and its enforcement. They will be encouraged to organize the exchange of information between bureau members and the General Assembly in a more systematic fashion, so as to ensure the transparency of decision-making. In this connection, internal regulations will be developed by the OSPs themselves and compiled into a procedures manual on internal organization.

11. **Specific support to federating organizations.** The federating organizations will receive specific support in the above-mentioned areas so that they can handle the important tasks of group-level supply and marketing, management of marketing credit, production of financial statements, and operation and maintenance of large schemes. Finally the federating organizations will be helped in their effort to regularize their status.

12. **Training for the establishment and management of OSP's own funds.** The OSPs, whether cooperatives or federating organizations, will be encouraged to set up aside equity funds similar to those created at Foum-Gleita so that they can self-finance a portion of their activities and have more latitude vis-à-vis short-term credit. Support to OSPs will include the training needed to establish and manage these funds.

## **B. Support to Management and Organization of Individual Farms**

13. Individual producers have irrigated schemes varying between few hectares to few hundreds of hectares. Small individual farmers (less than 40 ha) represent 66% of the total number of individual farmers population. Most of these farmers, who are newcomers to agriculture, have not yet developed the skills needed to manage an agricultural undertaking. Support to these producers will be slightly different from that provided to the OSPs, since problems of collective farm management and literacy do not apply. This support will deal essentially with: (a) management of irrigation infrastructures and equipment; (b)

financial management; and (c) farm organization. They will be convened periodically to training sessions on topics of interest to them. These topics will be determined in consultation with beneficiaries on the basis of their needs. These periodic meetings will also be an opportunity for producers to trade information on their experiences.

### **C. Support to Institutions and their Financing**

14. During Phase I of the IDPIAM, and because of the limited number of private firms and NGOs with adequate skills capacity, the support to farmers in organization and management will be entrusted to SONADER in its current zone of intervention. However, SONADER will work in partnership with DRAP, the existing NGOs (AFVP, ACOPAM and CARITAS) and private firms.

15. In order to ensure that SONADER and the associated institutions work on producers' priorities, annual support programs will be systematically developed on the basis of village-level diagnostics and will be designed at the grassroots level, before being consolidated at regional, then national, levels.

16. In the zone of intervention of AGETA (*Association générale des groupements d'exploitants et éleveurs pour l'étude et l'emploi des techniques améliorées agricoles et animales*), the plan is for this institution to eventually become self-financing on the basis of payments of its own members' dues, once these members are sufficiently numerous and able to pay dues corresponding to services rendered. In the meantime, instead of direct budget support to AGETA, its members would receive support in the form of grant representing a portion of their membership dues. The portion financed under the IDPIAM would range from 90% for the poorest members to 20% for the others. During the first year of Phase I of the IDPIAM, discussions will be held with AGETA to study this arrangement and to determine new levels of membership dues. An agreement between the CU-IDPIAM and AGETA could be signed during the second year.

17. This support will be funded, in Year 1, jointly by IDPIAM and the IDA funded Agricultural Services Project (ASP). Since the latter will close on December 31, 2000, funding for Years 2 and 3 will be fully provided by IDPIAM.

**Component D: SUPPORT TO TRADITIONAL CROPS SECTOR**  
Mauritania: Integrated Development Project for Irrigated Agriculture

*(US\$ 11.700 million)*

1. Support to traditional crops has two aspects: (i) improving the competitiveness of the rice subsector by increasing productivity and the quality of locally-produced rice through appropriate technical messages and financial and institutional support and improving rice processing and marketing; and (ii) providing technical and financial support for the development of other traditional crops that are currently cultivated on small areas.

2. Support to traditional crops will be provided jointly, in Year 1, under the IDPIAM and the Agricultural Services Project (ASP). Since the latter closes on December 31, 2000, funding for Year 2 and Year 3 will be provided under the IDPIAM.

**Technical Support**

*Dissemination of messages to improve rice quality and productivity*

3. Rice quality and yields (3-4 tons per ha) in Mauritania are currently below expectations. Under similar ecological conditions, the Senegalese producers' association in the Delta achieves an average yield of 5.5 tons per ha and a cropping intensity of 1.3. The best producers in Senegal steadily produce yields of 10 tons per ha.<sup>1</sup> The following interventions are planned to improve rice productivity:

- (i) production by CNARADA of pre-base IR and Sahel seed varieties, which have good tasting characteristics. These pre-base seeds will be then reproduced by seed farmers for large-scale commercial distribution to producers. Choosing the proper variety is the key to quality for every agricultural product;
- (ii) distribution to extension agents and producers of the manual on weed identification and control, as well as training on the subject, since weed control is a major obstacle to improved rice yield and quality;
- (iii) support to producers' organizations to help them obtain the required fertilizer in a timely manner and at a good price, including phosphate fertilizer, which is currently little used despite its known positive impact on rice yield and quality;
- (iv) use of the RIDEV software package to design and disseminate technical messages on rice: sowing date, fertilizing date, irrigation schedules, harvesting timetable;
- (v) improvement of extension agents' overall knowledge of rice cultivation to help them dispense more effective advice on the subject. This training will be provided by the West Africa Rice Development Association (WARDA), a regional institution specialized in rice, which possesses a vast experience in the Senegal River Valley; and
- (vi) identification of the best producers and their cropping methods so that others can benefit from their know-how. In this connection, farmer-to-farmer visits will be organized, including to Senegal.

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<sup>1</sup> Information provided by the *Union des périmètres autogérés de Dagana* to the Bank Senegal Mission.

*Dissemination of messages to improve the productivity of flood-recession crops*

4. The following technical recommendations to improve flood-recession crop yields will be disseminated during Phase I of the IDPIAM: treatment of sorghum seed against pests, thinning, seed density control, conservation of cowpeas in storage against weevil damage.

*Technical support and promotion of other traditional crops*

5. The current trend is towards crop diversification, to reduce the risks associated with monoculture and to help Mauritanian producers uncover crops for which they have a comparative advantage and that will increase the profitability of their farms. Some of the diversification crops are already known to farmers but are produced in a traditional way and at small scale. Their use will be promoted and improved under the present component. The new diversification crops considered for larger scale production and exports will be dealt with under the Diversification component under Annex 2-E.

6. To help farmers in this regard, the following activities will be included under this component:

- (i) promotion of fodder and livestock feed production among milk producers in Trarza to substitute for imported livestock feed (which is becoming more costly due to the declining exchange rate of the Ouguya), and thus to foster the integration of livestock and irrigated agriculture;
- (ii) development of irrigated oilseed crops and testing of artisanal oil presses. If proven profitable, this activity would lead to local production of oil, an important item in household budgets and in balanced diets;
- (iii) promotion of wood production on irrigated schemes to reduce pressure on the country's remaining forest resources and create new sources of farm income;
- (iv) wide dissemination of artisanal methods of vegetable conservation. Such methods, which are starting to become known in the rural sector, will allow households to have access to vegetables all year round;
- (v) training of extension agents to deal with crops other than rice; and
- (vi) funding of special extension services for crop diversification. Producers will have access to this funding on-demand by making a financial contribution (20 percent of the service cost for OSPs and 50 percent for individuals). Such services will be contracted out to private agencies and NGOs on a competitive basis. This initiative will give producers greater control over the monitoring and evaluation of services they receive, and will prepare them for greater involvement in the management of these services over the next two phases of the IDPIAM. Also, it will help improve the quality of these services as a result of the competition it engenders.

*Promotion of an intermediate level of mechanization*

7. Almost all agricultural tasks on village irrigated schemes are either done manually, which is time-consuming for farmers and often involves delays that hamper crop intensification, or with heavy equipment (tractors, combine harvesters) at great expense. Under this component, intermediate

mechanization will be developed and tailored to the needs of smallholders. The following activities are underway in this regard:

- (i) introduction of animal traction for plowing on irrigated village schemes; this activity, in addition to easing farmers' labor burden in manual plowing and leveling, will help integrate livestock into irrigated agriculture; and
- (ii) introduction of the artisanal rice thresher developed by WARDA and disseminated successfully in other countries in the region (Senegal, Mali, Burkina Faso): This thresher/winnowing machine will ease labor-intensive harvesting tasks and will foster intensification by allowing fields to be rapidly cleared after harvest in preparation for the next crop. Indeed, the overlapping of crops is currently one of the major obstacles to intensification.

*Establishment of quality norms for rice and information system on national and international market prices:*

8. Normalized quality standards for rice and paddy will be established, as well as an effective information system for producers on national and international rice prices.

### **Financial Support**

*Financial support for production, storage and marketing*

9. A line of credit will be made available under this component to finance credits: (i) on short-term basis for agricultural inputs for incremental production of all traditional crops (provided that they fulfill credit eligibility conditions) and for marketing of local rice; (ii) on medium-term basis for rice and other products processing equipment; and (iii) on a long-term basis for grain storage facilities. A subsidy is envisaged to finance 30 percent of the cost of grain storage facility construction for producers' organizations.

**Component E: DIVERSIFICATION PROMOTION**  
Mauritania: Integrated Development Project for Irrigated Agriculture

(US\$ 8.072 million)

1. In its Rural Sector Development Strategy Through 2010, the Mauritanian Government identifies diversification as a priority avenue of development whose objectives are: (i) improvement of productivity, with emphasis on the adaptation of varieties and agronomic techniques; (ii) market promotion of products for local consumption; (iii) export promotion for high-performing agricultural enterprises through the development of partnerships; (iv) artisanal and industrial conservation and processing, in order to absorb seasonal surpluses and expand markets. In all commodity subsectors, the private sector is called upon to play a pioneering role in the exploitation of resources, through an adequate volume of investment and the introduction of new modes of partnership. The State will provide a favorable environment, through the development of infrastructures, an appropriate institutional framework, and the necessary measures to promote investment. However, sustained efforts on behalf of traditional farmers must be maintained in order to ensure the balanced development of the best-performing crops.

**Local market**

2. At the local level, consumption habits have changed as settlement has progressed, thus creating demand for fresh fruits and vegetables and stimulating a great deal of upstream and downstream economic activities. At present, the volume of production of Mauritanian farmers in the Senegal River Valley (30,000 tons on 1,200 ha) covers only a part of these needs due to the pronounced seasonality of production (mainly January – April). Production consists of staple foods such as onions, cabbage, carrots, eggplants, turnips, sweet potatoes and tomatoes. Attempts have been made, however, to grow potatoes, beets and okra, which are also prized by consumers. Finally, local fruit production is emerging with the appearance of bananas, melons and citrus. During periods of shortage, imports from Senegal and Europe fill the void left by local production, but at a high price that prevents poorer populations' access to fresh fruits and vegetables all year round. During the 8-month, shortfall period, there is thus a strong unmet demand at reasonable prices. This means that strong growth of the local market can be anticipated if measures are taken to prolong the period of availability and increase the supply of lower-priced Mauritanian produce. Lower priced fruits and vegetables year round will have a strong import substitution, as well as a market expansion effect.

3. Aside from the fruits and vegetable subsector, a need for fodder has emerged due to the development of semi-sedentary raising of cattle and camels, which, in addition to their role in traditional livestock activities, are supplying a nascent dairy industry. In addition, experiments with oilseed crops (sunflower, groundnut, etc.) in the Valley point to the possibility of artisanal, and possibly industrial, production of vegetable oils for local consumption.

4. It is apparent that the local market for diversification crops is rapidly evolving and that measures should be taken to accompany this process. The constraints faced by farmers practicing diversification are of several types: (i) low level diversity of products and varieties on the market; (ii) high cost and limited availability of high-performance seed suited to local conditions; (iii) lack of know-how regarding fertilizer dosage, disease and pest management and agricultural techniques for the cooler off-season; (iv) limited access to production zones, especially during the rainy season; (v) limited availability of mechanical cultivation equipment suited to diversification crops; (vi) absence of refrigeration facilities that would prolong the marketing period; (vii) low level of development of the processing industry, which

limits market outlets to those handling perishable products; and (viii) absence of information on prices and product flows on the local market.

## **Exports**

5. Recent experiments with private operators have demonstrated the potential for exporting fresh fruits and vegetables to Europe (green beans, okra, and melons). Results of these pilot operations are sufficiently promising to allow one to anticipate the imminent start of an export industry. Although the volumes exported will be smaller than the volume of local production, they create nevertheless an undeniable source of hard currency for the country, and generate substantial profit margins for producers. In the short term, the targeted market niches will include crops suited to the European off-season (green bean, okra, melon, cherry tomatoes, and baby vegetables) and certain tropical fruits (papaya). Over the medium term, fruit production (mango, guava) and processing (spices, flavor extracts) could be envisaged. These are very competitive markets, but Mauritania has some comparative advantage that will position the country favorably: (i) Mauritania is the closest source of tropical fruit to Europe, whether by air or sea, which means a maximum transport time of 10 days to the main ports; (ii) from the standpoint of climate, the low humidity, sunshine and temperature range are favorable to off-season crops; (iii) basic irrigation and other infrastructure exist in the production zones along the Senegal river, and particularly around Rosso; (iv) there are dynamic private entrepreneurs with considerable financial resources; (v) factor costs are comparable to those of other exporting countries.

6. A number of limiting factors persist, however, and will need to be overcome in order to attain the degree of competitiveness required for viable and sustainable penetration of exports: (i) lack of logistical and conservation infrastructures; (ii) low competitiveness / productivity of current production practices; (iii) market participants' lack of information on external market conditions (prices, practices, norms, etc.); (iv) poor access due to limited airline connections and irregular schedules of cargo ships; (v) highly taxed packaging and other inputs; (vi) legal, fiscal and custom tariffs structure ill-adapted to export activities.

## **Diversification activities**

7. Table 1 shows the anticipated progression of diversification crop areas, based on the following conditions: (i) strong growth of crops destined for local markets once agronomic constraints and logistical and marketing bottlenecks are overcome; (ii) areas planted to fruit crops under Phase I of the IDPIAM (citrus, mango, guava, other) expanding under Phases II and III, once agronomic parameters are more firmly fixed; (iii) areas destined for the production of export crops starting with pilot-scale operations, to be followed by an expansion of the area under production; (iv) participatory and flexible process chosen (pilot operations initiated by operators and the market) allowing for an increasing proportion of crops not currently envisaged (groundnut, various spices, etc.).

8. IDPIAM's diversification component aims to overcome obstacles to the diversification of crops in the Valley. The activities envisioned are aimed at helping to develop, through local private farmers, marketing opportunities at the local and export levels, by means of targeted support measures aimed at overcoming technical bottlenecks and farmers' lack of information. Diversification activities will revolve around shared-cost pilot operations in support of the initiatives of private operators and cooperative groups. During the initial learning stages, the design of pilot activities will be at the initiative of the project. Subsequently, operators will be able to design and propose pilot operations to the program's administrators.

9. Strategic studies: In support of these pilot activities, strategic studies will help identify market opportunities (local and export) as well as constraints caused by the legal, fiscal, customs, and regulatory

environment. Although they will include a diagnostic aspect, these studies will aim primarily at identifying scenarios for pilot activities that could be proposed to operators, as well as measures to reduce, or even eliminate, the legal and regulatory constraints.

10. Pilot diversification activities: Pilot activities will help operators or cooperative groups to conduct the necessary technical and marketing experiments to develop a profitable activity and will confirm operators' capacity to actually fulfill the technical and marketing potential indicated by the strategic studies. This process will optimize the cost of the subsidy based on the factual information generated by the pilot operation. Pilot activities financed under IDPIAM will be varied: (i) *introductory pilot activities*: tests of the behavior of various promising varieties of new crops (fruits and vegetables) on small parcels, introduction of new production techniques (greenhouses, drip irrigation), demonstration units for various processing technologies (drying, juice extraction), evaluation of samples, test batches for export, study trips to investigate markets (buyers, distribution networks, competitors, market trends); (ii) *pilot productivity improvement activities*: experimental selection of cultivars adapted to the pre-harvest gap period (for local markets), development of collection and processing schemes that optimize quality (thermal protection at the point of harvest, packaging); (iii) *pilot extension and coaching activities*: technical and commercial support to programs involving consolidation, operation of refrigeration facilities by farmers' groups for the local market, application of quality norms, export campaigns, introduction of air transport logistics, initiation of promotional activities (fairs, produce labeling).

11. Information and dissemination system: Monitoring of diversification activities requires a system of information that: (i) provides time series data, for a set of local and export products, on market volumes and prices; (ii) allows the design of a database that includes, among others, technical and economic worksheets, specification of selection criteria, norms for processing and transportation conditions, cost structure of local and export transit; and (iii) provides a database for M&E based on the first two databases and the roster of IDPIAM clients.

12. Institutional structuring: Regarding institutions, the diversification component of the IDPIAM will support: (i) the introduction of a plant disease control service trained and certified by MDRE's technical assistance and the training of personnel responsible for this task at ports and airports; (ii) the creation of commodity subsector committees that will help establish specifications for various crops, whether for export or the local market.

13. Infrastructures: The IDPIAM includes a provision for a basic logistical unit whose operation will be subcontracted out to a private firm by the CU-IDPIAM. This unit will provide operators engaged in pilot activities with basic agricultural equipment and an efficient post-harvest logistical organization, using simple and well-adapted technologies. Experiments with the local and export markets will be carried out under optimal conditions: a collective processing center (including refrigeration facilities) in the production zone (Rosso), farm-gate collection points, mobile isothermal/refrigerated equipment for collection, and tractor trailers for transfer of containers to points of embarkation. Improvements will be made to public infrastructures at the airport and port of Nouakchott: renovation of the Nouakchott airport's freight area, replacement of weighing equipment, creation of a refrigerated storage area, and purchase of lifting equipment. At the port of Nouakchott, electrical outlets and refrigerated storage areas will be required.

### **Implementation Strategy**

14. The diversification component will be implemented under the aegis of the CU-IDPIAM. Due to the experimental and highly operational nature of these activities, a special unit will be created within the CU-IDPIAM. Under the direction of the Coordinator of the CU-IDPIAM, this unit will be staffed as follows: (i) a person responsible for marketing, to whom questions of local and export marketing and

logistics can be referred; (ii) a person in charge of R&D, who will monitor the introductory and productivity-boosting activities; (iii) an agro-economist in charge of the analyses needed to evaluate dossiers on pilot diversification activities (pre-feasibility and diagnosis of results); this person will also handle the implementation and updating of the database; (iv) a resident, internationally-recruited technical assistance based in Rosso who will act as the field coordinator for diversification activities; (v) ad hoc technical assistance that will provide periodic assistance to the professionals in the unit on matters of development methods, and M&E of pilot activities. The technical assistant in charge of field coordination will be doubled by a local staff who will be trained on the job by the technical assistant whom he/she will replace at the end of Phase I.

15. The pilot activities will be financed on a shared-cost basis (*subvention à coûts partagés*) whose resources will be earmarked for pilot diversification activities guided by private operators. This fund will be administered by the CU-IDPIAM in accordance with specified procedures for disbursement and rules for the attribution of subsidies.

16. The diversification effort must be driven by the private sector. Thus, the CU-IDPIAM must seek to involve the private sector in the definition and implementation of diversification strategies. A consultative diversification committee will be created and charged with providing policy guidance on the IDPIAM's diversification program. This committee will be made up of representatives of IDPIAM's direct clientele, leaders of private enterprises, private groups, cooperative groups, support entities involved in pilot activities, etc. The CU-IDPIAM will provide the impetus for this committee to evaluate and express opinions on the various pilot diversification activity dossiers. During Phase I of IDPIAM, the committee's role will be essentially consultative. Subsequently, depending on the degree of ownership shown by its members, its role could be expanded to that of a commission on resource allocation or a board of directors.

17. The pilot activities will require sustained technical assistance to ensure the optimal implementation of the pilot experiments and marketing programs in the rural sector. Experts assigned to this function typically have a more operational than scientific profile and are recruited in Mediterranean countries with considerable experience of conditions similar to those prevailing in the Valley. To back them up, ad hoc missions of a more specifically scientific nature will be provided to perform diagnostic analyses or fine-tuning program studies. Services of international marketing consulting firms will be retained to perform the strategic fine-tuning of pilot activities in support of exports, and will come into play downstream of the pilot export marketing activities: definition of specifications, search for partners, coordination of product transit tests, etc. It will be necessary to subcontract some computer services for programming and for the development of databases used for the diversification component (markets, techniques, clientele).

**Component F: ENVIRONMENTAL IMPACT MITIGATION MEASURES**  
**Mauritania: Integrated Development Project for Irrigated Agriculture**

(US\$ 3.141 million)

**A. Environmental Problems Associated with Irrigation**

1. The Valley's main environmental problems are: waterlogging, salinity and waterborne diseases. Poor drainage is one of the main causes of waterlogging and salinity. These environmental problems have an adverse affect on the productivity of land (waterlogging, salinity and alkalinity) and labor (waterborne illnesses such as intestinal infections, bilharzia and malaria) and, thus, on the population's income and quality of life. Also, outside of the irrigated areas, communities that depend on flood-recession crops have been affected by dams that have reduced floods. In these areas, the reduction in flooding has also had an adverse impact on aquifers that feed wells that, in turn, supply potable water to local populations.

2. The Valley's future environmental problems will be caused by: (i) existing infrastructures (Manantali and Diama dams and their main hydraulic axes) and (ii) infrastructures that will be created under the IDPIAM. The latter include (a) major civil engineering works (main canals and drainage structures, etc.); (b) small public works (connector roads, small culverts, etc); (c) the rehabilitation, expansion and creation of small irrigated schemes; and (d) small village infrastructures (wells, grain stores, etc.). According to World Bank guidelines, only the infrastructure works described under (a) fall into environmental category "A", nonetheless, the whole IDPIAM has been considered as under this category.

3. During Phase I of the IDPIAM, there will be no major infrastructural works, but instead only feasibility studies for works that could be carried out under Phase II. These studies will include environmental impact analyses (EIAs). Phase I of the IDPIAM will, however, involve the rehabilitation of nearly 3,000 ha of existing schemes (including some extension of those schemes) and 100 ha of new schemes. For any new activities to be carried out on the irrigated schemes, satisfactory EIAs will need to be produced based on norms developed at the beginning of the IDPIAM and will be periodically revised during Phase I and beyond. It is expected that works aimed at rehabilitating and developing existing or new irrigation schemes will have a positive impact on the prevalence of waterborne illnesses such as intestinal parasites, bilharzia and malaria, since such works improve drainage and thus reduce the volume of stagnant water.

**B. Mitigation Measures: Components**

4. IDPIAM's environmental component will include the following main elements: (i) establishment of a system of environmental assessment, management and monitoring; (ii) development of environmental standards; (iii) creation of land use plans (*plans d'occupation des sols - POS*); and (iv) concrete measures to mitigate environmental impacts.

***(i) Establishment of an environmental assessment, management and monitoring system***

5. An environmental assessment, management and monitoring system for the Valley will be developed and put into practice to help decision-makers take appropriate measures to prevent and mitigate environmental impacts.

6. An environmental information system (EIS) will be set up to monitor general environmental and natural resource trends all over the Valley, and more specifically in the irrigated areas.

7. Data will be gathered on a regular basis in accordance with specified protocols and transferred to an ordinary GIS-type map. This tool will be used as an information crossroads, which each agency collecting data pertaining to it, but sharing that data with others through a computer network. The whole mechanism will constitute an environmental observatory. This facility will make it possible to: (1) monitor the salinity or alkalinity of soils and their impacts on crop yields; (2) monitor the impact of irrigation on the replenishment and salinity of aquifers; (3) model overall water consumption at the scale of hydraulic units for purposes of planning irrigation at the scale of the whole Valley; (4) study trends in the quality of surface water in channels, which are often used simultaneously for irrigation and drainage. This environmental observatory will need to be linked to the environmental monitoring station that OMVS intends to set up soon in Dakar. This will allow Mauritanian, Senegalese and Malian authorities to collaborate on the resolution of environmental problems relevant to several countries located on the Senegal River.

8. MDRE lacks skills in the areas of environmental assessment, management and monitoring, and also lacks specialists in EIA who could handle the implementation and monitoring of the environmental component. A program of skills development in these areas will therefore be instituted under the IDPIAM-IDA at the level of the agencies involved: (1) DEAR (Directorate for Environment and Rural Equipment) which is responsible for developing terms of reference, evaluation and follow-up of EIAs; (2) SONADER, which is charged with applying environmental standards and incorporating environmental and social factors into water management; (3) local consultants responsible for carrying out EIAs and for implementing mitigation plans; (4) the universities that will perform EIAs and environmental research; and (5) NGOs involved in participatory planning for the preparation and implementation of land use plans (*plans d'occupation des sols - POS*).

***(ii) Development of environmental standards***

9. Environmental assessments indicate a need to respect certain technical criteria during the establishment and the operation and maintenance of irrigation infrastructures. Some subject areas should be subject to absolute technical standards, while other criteria are more on the order of "best practices" recommendations that could be promoted by means of incentives. The main themes to be dealt with include: (1) implementation of water management schemes that limit salinity and alkalinity, as well as drainage infrastructures; (2) arrangements to protect soils from wind erosion and sand encroachment; and (3) arrangements for the use of fertilizers, herbicides and pesticides, as well as for sanitation and prevention of waterborne illnesses.

***(iii) Land use plans***

10. The lower and mid Valley, which are the main current beneficiaries of the spillover effects of the dams on the Senegal River, are being rapidly settled by groups and individuals with little or no experience with agriculture, and particularly with irrigated agriculture. In an anarchic fashion, some people are occupying lands that they sometimes developed in a very rudimentary way. The consequences of this settlement may prove costly. Developers and decision-makers lack the means to develop investment strategies that take environmental and social constraints into account. The challenge is therefore to develop a participatory technical approach that can: (1) promote the integration of irrigated schemes with other activities in the Valley (rainfed and flood recession agriculture, livestock, fishing, hunting, etc.); (2) develop a local consensus on the issues of sustainable development and land occupation, allowing all stakeholders to participate in the definition and management of resources and spaces; (3) provide national and local authorities with the data and tools needed to plan structuring investments on the basis of a

participatory and consultative approach to beneficiaries. Land use plans will therefore be prepared in accordance with a participatory approach, and technical and managerial procedures will be recommended to ensure efficient environmental and social management (avoidance of social conflicts related to land use).

*(iv) Concrete environmental impact mitigation measures*

11. Funding will be put in place to finance physical measures to mitigate negative environmental impacts in the Valley, which will be identified in the course of program implementation. Details are provided in the environment working document in the IDPIAM project file. In addition, specific funding has been made available to Mauritania under the IDA-financed Health Sector Project to combat waterborne diseases. Mitigation measures related to health will therefore be handled under that project. IDPIAM will finance annual surveys of the effect of new infrastructures on the incidence of infectious disease and will propose mitigation measures to be financed under the Health Sector Project.

**C. Mitigation Measures: Implementation**

12. DEAR will be responsible for supervising environmental aspects of the project. It will ensure the quality of EIAs, as well as the relevance and quality of mitigation measures. It will be responsible for developing, putting in place and managing the system of environmental information and monitoring called for under the program. The CU-IDPIAM will be charged with managing funds earmarked for the environmental component.

**Component G1: PROJECT MANAGEMENT**  
Mauritania: Integrated Development Project for Irrigated Agriculture

(US\$ 2.916 million)

1. The basic principles underlying the IDPIAM's proposed organization and modes of implementation of its components are based on the observation that, in order to have a system which functions well, it is important to have a clear idea of the structure and position of the public sector and its functions, roles, and responsibilities vis-à-vis the private sector. The principles can be summarized as follows:

- separation of policy/strategic and program implementation functions;
- coherence between strategies and the implementation program;
- separation of the financing, "purchase" and delivery of services;
- competition among service providers;
- contractualization of services;
- specification of performance goals (in terms of results and not only in terms of resources made available) for public as well as private service providers;
- correlation between performance goals and their measurable indicators, and between financing and resources made available;
- performance monitoring and evaluation with reference to resources used;
- clear prior definition of individual and collective responsibilities;
- establishment of forums for information and consultation among users, private service providers and public agencies; and
- involvement of clients or service beneficiaries/users as early as possible in the decision-making process regarding investments.

2. Overall responsibility for program implementation will reside within the MDRE, through the CU-IDPIAM. This is consistent with Government reforms recommending that ministries withdraw from certain implementation functions, leaving these to private operators, and that they reorient their public service activities in the direction of policy, public investment planning and monitoring/evaluation. The following arrangements are therefore planned:

- an Interministerial Policy Committee will provide policy guidance to IDPIAM;
- a Steering Committee will pilot the IDPIAM;
- the CU-IDPIAM, which already exists, will manage and coordinate the overall program, funding and M&E;
- SONADER, under the aegis of MDRE, will exercise a delegated works oversight function for studies and public investment works, and will help producers manage investments and master production techniques;
- UNCACEM will handle the credit function, which will also be open to other financial institutions under Phases II and III of the program;
- functions of support, monitoring and control will be exercised by various departments of the MDRE, including: the future Directorate for Policy and Monitoring/Evaluation (DPSE), the Directorate for Environment and the Rural Sector (DEAR), the Directorate for Research, Training and Extension (DRFV); and the Directorate for Agro-Pastoral Resources (DRAP); and
- specialized support functions will be provided by agencies other than MDRE, and in particular by the *Office national de la statistique* (ONS) and NGOs.

3. The Interministerial Policy Committee (*Comité interministériel d'orientation et de suivi du IDPIAM* -- CIMOS) headed by the Minister of Rural Development, is made up of representatives of the relevant ministries and donors. It develops policy, and evaluates and monitors the program's broad themes with a view to harmonizing operations with national policy objectives. The relevant ministries will be: Economy and Development, Finance, Trade, Hydraulics, and Interior. The relevant donors are those currently involved in rural development in Mauritania.
4. The Steering Committee (*Comité de Pilotage du IDPIAM* -- CP/IDPIAM) will be headed by the Director of Planning and Studies at the Ministry of Economy and Development (MAED) and composed of technical representatives of the relevant ministries, SONADER, relevant donors, representatives of farmers and their organizations, NGOs and UNCACEM. The CP/IDPIAM will, in accordance with decisions reached by CIMOS, define the program's policy orientations and rules, approve action plans and assess implementation progress. This committee constitutes the institutional structure within which decisions are made on policy, follow-up and harmonization of the IDPIAM's operations. Decisions are made by this committee on the basis of information and proposals developed by the CU/IDPIAM, which is the committee's main tool for deciding which measures to take and for monitoring of their application.
5. The CU/IDPIAM, attached to the cabinet of MDRE, is responsible for programming, coordination, supervision, financial management and monitoring/evaluation for the program as a whole. It defines and creates the conditions under which the program is implemented. The actual implementation of these activities will be contracted out on a competitive basis to competent public or private entities, although CU/IDPIAM will also implement certain components. CU/IDPIAM will be responsible for preparing the program's annual financial statements in accordance with internationally accepted financial principles and for seeing that these are certified. It will also issue periodic technical reports, and will ensure that disbursements are handled in accordance with IDA guidelines. The financial management systems will be computerized and will allow for expenditure monitoring by category, component and implementing agency. Files on all financial transactions relating to the IDPIAM will be maintained and made available to IDA. Special accounts will be opened at a commercial bank for CU/IDPIAM, SONADER and UNCACEM. Two different independent auditors will perform financial and technical audits each year.
6. The DPSE will be responsible for supervising studies of sectoral policy, legal and fiscal reform, as well as for studies and analysis of sectoral statistics.
7. The DEAR will supervise the program's environmental aspects. It will ensure the quality of Environmental Impact Assessments (EIAs), and the appropriateness and quality of mitigation measures. It will be responsible for the development, installation and management of the information and environmental monitoring system planned under the program.
8. The DRFV, which is currently responsible for implementing the IDA-financed Agricultural Services Project (ASP), will be responsible for IDPIAM-financed activities similar in nature to those of the ASP. It will ensure the technical coordination of research, training and extension activities to be carried out by specialized agencies.
9. The DRAP will supervise activities associated with livestock and fodder crops, as well as support to OSPs.
10. SONADER, a so-called *établissement public à caractère industriel et commercial* (EPIC) under the authority of MDRE and subject to the Law of October 1990, is an important operator with three assigned tasks under the terms of a triennial performance contract: (i) delegated works oversight for

hydro-agricultural investments; (ii) management of State-financed public infrastructures; and (iii) advice to farmers and farmer groups on irrigated schemes. In the context of IDPIAM's implementation, SONADER will handle: (a) delegated works oversight for studies and works planned under the program; (b) assistance to UNCACEM for studies and rehabilitation works on individual or village-level irrigated schemes; and (c) extension in the areas of agricultural techniques, organization and management. These activities will be carried out in partnership with NGOs such as AFVP and ACOPAM. SONADER will also approve, on behalf of the Government, investment plans for schemes that are candidates for rehabilitation or extension, or for the development of new schemes.

11. During Phase I, UNCACEM will be responsible for providing short-, medium- and long-term credit to finance productive activities and investments in the Valley. The procedures for granting loans are detailed in Annex 2-ST of this document.

**Component G2: MONITORING AND EVALUATION**  
Mauritania: Integrated Development Project for Irrigated Agriculture

(US\$ 0.936 million )

**A. Rationale for the M&E system**

1. The IDPIAM's strategy for sustainable development in the Senegal River Valley rests entirely upon the strengthening of producers' capacity and on the redefinition of the roles of the State and the public and private services involved in supporting production, as well as in upstream and downstream activities. This strategy involves a large number of stakeholders in the cycle of planning and decision-making for program-supported interventions. At each stage (financing request, appraisal, approval and detailed action plan, implementation, adjustments, regular balance sheets, consolidation of accomplishments), certain key data are required.

2. M&E is a management and decision-making tool that allows all stakeholders, i.e. producers, private and public partners and all project staff, to understand the process thoroughly. Thus, the M&E approach adopted under the IDPIAM consists of organizing a systematic flow of useful information needed for analysis and decision-making by those involved in each step of the implementation of a program or activity. Such a system also produces data sets that are compatible with each other. In-depth statistical analysis can then be initiated at the national level, and medium- and long-term strategic policies developed.

**B. Description of the M&E system**

3. The Monitoring and Evaluation system will involve two types of monitoring: implementation monitoring and impact monitoring.

4. *Implementation monitoring* is concerned with the progress of program activities in relation to forecasts. It provides updates on the status of the project's physical and financial implementation, as well as on difficulties/issues encountered and proposed solutions.

5. The detailed information needed for implementation monitoring is gathered from planning tools that already exist: work plans, budgets and sources of financing, schedules, etc. This information can be reorganized into three broad data categories:

- inputs, or resources contributed by the project (costs, humans resources);
- the implementation process (deadlines, problems, beneficiary assessments); and
- outputs, or the project's concrete accomplishments (physical quantities and number of beneficiaries ).

6. Data generated periodically by the implementation monitoring function will reveal possible gaps between forecasts (planning) and actual accomplishments, i.e., the physical and financial implementation ratio. Difficulties encountered and explanatory factors will be identified and analyzed in order to develop the appropriate corrective measures. Implementation indicators such as the number of beneficiaries, their assessment of the quality of interventions, human resource utilization ratios, and time elapsed for each stage, will be calculated on an annual basis.

7. An important aspect of the M&E system will be the linkage of the financial monitoring system with the technical monitoring system: analytical accounting will be instituted, along with a common nomenclature for activities, expenditure categories and cost centers.<sup>1</sup>

8. **Impact monitoring** endeavors determine the extent to which the implementation of various project activities has contributed to the desired development objectives. Although it is generally recommended, in project planning, that a single objective and few indicators be identified, it is to be expected that, in the case of a complex project or a program consisting of several different interventions, a greater number of secondary objectives and indicators may be involved. While the number of objectives and indicators should be kept as small as possible, it is important to keep in mind that the scope and complexity of IDPIAM, as well as the large number of participants, could make impact evaluation difficult if there are too few objectives.

9. M&E will allow each stakeholder to perceive the “changes” caused by the implementation of various project-supported activities. These changes will be evaluated in reference to a baseline situation established prior to project start-up. Analysis of the baseline situation and of any changes that occur requires an effective data-gathering mechanism allowing for the comparison of “with” and “without” project scenarios with reference to: (i) certain types of project-supported activities (with and without rehabilitation, with and without support for organization and management); and (ii) different types of perimeters (e.g., small collective, large collective, small individual, large individual).

10. In the case of IDPIAM, the data needed to describe, measure and categorize these changes can be grouped into four broad categories of impacts, or what one might call the “pillars” of IDPIAM’s success :

- **improvement of socio-economic conditions** , perceptible at the farmers’ level as well as within rural communities affected by the development of irrigated agriculture, and among urban consumers;
- **strengthening of local capacities**, so that farmers can be full-fledged and responsible participants in the Valley’s development;
- **establishment of a favorable and enabling policy, legal and institutional framework** that allows stakeholders to participate fully in the decision-making and investment process ; and
- **preservation of the Valley’s productive natural resource capital**, thereby ensuring long-term sustainability of the production system.

11. When organized in this way, all of this information constitutes the conceptual framework for impact monitoring.

12. The specific indicators for each of the broad impact categories have been identified during project preparation, based on the specific issues posed in each area. They are included in the IDPIAM’s Logical Framework (Annex I).

13. This framework may at first seem vast , but in actual practice each participant only undertakes a limited number of interventions having a specific impact in one of the four main impact categories or pillars. Thus, the number of indicators and the associated data-gathering are limited. The M&E

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<sup>1</sup> A cost center is responsible for implementing an activity or an entire component. This means that the financing request, the planning of activities, and the production of progress reports on activities for which it is responsible will occur at this level. These different « cost centers » will report on indicators specifically relevant to them.

Procedures Manual will include a guide to help organize impact monitoring data and limit it to data that are useful and absolutely necessary.

**C. Key M&E indicators**

14. At the central level, the quarterly project reports will summarize status and efficiency of implementation, whereas annual reports will state the most significant changes observed in the field. More specifically, a performance chart will be created to report on the key indicators monitored by IDPIAM managers. These indicators are shown in the following table.

<p><b>PERFORMANCE CHART KEY INDICATORS FOR IDPIAM PHASE I</b></p> <ol style="list-style-type: none"><li>1. Continued absence of distortions in the rice sector, as decided in 1999.</li><li>2. Enforcement of Decree 98/48 and Bylaw R075 on transport sector liberalization.</li><li>3. Satisfactory repayment rate (at least 95%) on credit granted by UNCACEM.</li><li>4. UNCACEM's operational and financial self-sufficiency assured by 2001;</li><li>5. Eligible and fulfilled credit requests represent at least 75% of development goals.</li><li>6. Creation of transparent and accessible land registries allowing the verification of land use permits and temporary or permanent land concessions.</li><li>7. Transparency, equity and security of land tenure, as measured by the results of participatory surveys.</li><li>8. Satisfactory access to agricultural services for poor families, as indicated by the results of participatory surveys.</li><li>9. Economic return on State-supported hydro-agricultural investments demonstrated satisfactorily, as indicated by the first results available.</li><li>10. Establishment of procedures for collecting water fees and operation/and maintenance charges for collective infrastructures.</li><li>11. Completion of feasibility studies, including environmental impact assessments (EIAs) for non-farm infrastructures (required for investments planned under Phase II.)</li></ol>
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**D. Implementation of the M&E system**

15. *Centers of decision and monitoring/evaluation.* The institutional package chosen for the project envisages three levels, or centers of decision-making and monitoring:

- The local level. This level refers to individuals or collectivities wanting to set up an infrastructure (irrigated perimeter, storage facility or processing infrastructure, etc.) They will be responsible for identifying, planning, implementing, monitoring and evaluating the investments they wish to make in order to rehabilitate or increase the profitability of the infrastructure in question.
- The regional level. This level refers to private and public services (SONADER, BAF, UNCACEM, Regional directorate for rural development, NGOs, AFVP, AGETA, ACOPAM, consulting firms, etc.) supporting local levels promoters either with financing (credit, subsidies) or technical service delivery.
- The national level. It refers mainly to Institutions responsible for policy guidance and resources coordination for the development of the Valley, ensuring quality control, assistance

to support services and strengthening of their capacities, and for the development of an enabling environment.

16. The personnel responsible for M&E are located at these three decision-making levels.

17. *The main tools* used for M&E, in the areas of both implementation and impact monitoring, are described in the M&E Procedures Manual and consist of the following :

- the conceptual framework, which identifies useful indicators and data and organizes the information needed for decision-making;
- data-gathering tools adapted to: farmers and socio-professional organizations (OSPs); the organizations that support them; and project staff (participatory tools particularly suited to OSPs, financing request forms, monitoring notebooks, reports, guides to data-gathering for impact monitoring);
- tools for data synthesis and output (computerized performance charts, database, various communication aids for the output and exploitation of results obtained at the irrigated scheme level or at regional or national levels ).

18. *Coordination of M&E and support to decision-makers.* An M&E specialist will be recruited for the CU-IDPIAM to help set up the various M&E tools for local stakeholders at the three levels of intervention. This person's specific mandate will be to: (i) provide those involved with tools for collecting and circulating the information that will provide structure for IDPIAM's management; (ii) prepare performance charts for the data analysis needed to coordinate stakeholders' activities and improve implementation; (iii) check the quality of data in the database; (iv) aggregate project activity data for the preparation of reports to the Government and donors; (v) manage IDPIAM's database; and (vi) collaborate with the Directorate for Policy and Monitoring/Evaluation on project impact monitoring.

19. The M&E specialist will be aided in this task by three M&E staff at the regional level, in Boghé, Kaédi and Rosso. Their specific mandate will include: (i) management of the database at the regional level (pooling of irrigated schemes data transmitted by the person assisting farmers in organization and management (component c); (ii) M&E training for stakeholders; (iii) monitoring the quality of field data; and (iv) promoting the informal network of data output, dissemination and exploitation at the field level in the interest of better coordination among stakeholders (BAF, UNCACEM, SONADER, DPSE).

## **E. Conclusion**

20. Outreach, training and close monitoring are key ingredients in the success of this type of M&E system, given the large number of new ideas to be introduced and stakeholders to train. Success depends on the following factors:

- well-defined objectives;
- accurate gauging of results in both quantitative and qualitative terms;
- definition of efficiency ratios and other indicators;
- proper time management and coordination of activity programs;
- adaptation of M&E tools to community organizations to ensure their adoption;
- establishment of an effective analytical accounting system linked to the technical monitoring function; and
- publication and exploitation of data and results in order to prevent M&E tools from being perceived merely as checking tools.

21. An M&E training program, designed in a holistic and broadbased manner, will accompany the system's implementation during the first few years, in order to help all stakeholders learn to use the various M&E tools in their day-to-day activities.

**Special Topic: INVESTMENT FINANCING MECHANISMS – LOANS AND SUBSIDIES**  
**Mauritania: Integrated Development Project for Irrigated Agriculture**

**A. Credit**

1. The IDPIAM will provide a line of credit to finance private sector's investment and seasonal credit needs. Under Phase I, the credit line will be provided to UNCACEM. Under Phases II and III, it may also be available, under the same conditions, to commercial banks if they display an interest in rural sector financing and meet IDA's eligibility conditions.

*Credit envelope for Phase I*

2. Under Phase I, the line of credit will consist of two non-fungible envelopes:

- ◆ Envelope A, of 572 million UM for long-term loans for investments in irrigated schemes (rehabilitation, extension, and creation), broken down into three sub-envelopes, which are also non-fungible:
  - sub-envelop A1, containing 123 million UM<sup>1</sup> for collective irrigated schemes which are also eligible for matching grants;
  - sub-envelope A2, with 222 million UM<sup>2</sup> for individually-owned irrigated schemes whose owner has less than 40 ha (all schemes combined). This category is eligible for small farmers' matching grants;
  - sub-envelope A3, containing 227 million UM<sup>3</sup> for individually-owned irrigated schemes whose owner has more than 40 ha. This category is not eligible for matching grants.)
- ◆ Envelope B, of 1.484 million UM, to be used by UNCACEM for the short, medium, or long-term financing of any project (except for irrigated schemes covered by the preceding envelope) provided that: (a) it has to do with the rural sector (farmers, downstream operators or agricultural service providers); (b) it is in the IDPIAM project area; (c) it meets the conditions of eligibility and economic and financial return specified in the following paragraphs; (d) its risk level is acceptable from the banking standpoint.

3. Envelope B is large enough to finance the following needs identified under IDPIAM-IDA:

- production-related activities associated with the rehabilitation, extensions or creations financed under envelope A above<sup>4</sup> This will include medium-term financing for irrigation and agricultural equipment, and short-term financing for additional seasonal production input credit)

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<sup>1</sup> This allows (in taking account of reimbursements) funding for: 1000 ha of rehabilitation or rehabilitation/extension, based on estimated average financing of UM 123,000 per ha; and the creation of 50 ha of non-rice irrigated schemes, based on estimated average financing of UM 133,000 per ha.

<sup>2</sup> This allows (in taking account of reimbursements) funding for: 1000 ha of rehabilitation, based on estimated average financing of UM 221,000 per ha ; and the creation of 50 ha of non-rice irrigated schemes, based on estimated average financing of UM 243,000 per ha.

<sup>3</sup> This allows funding for 1,000 ha of rehabilitation, based on estimated average financing of UM 243,000 UM/ha

<sup>4</sup> That is, 3,000 ha of rehabilitation or extension and creation of 100 ha.

- post-harvest activities such as long-term financing for storage warehouses (planned capacity of 15,000 MT), medium-term financing for processing equipment (planned capacity of 10 000 MT for paddy processing) and short-term financing for marketing (volume required for marketing credit of 15,000, 20,000 and 30,000 MT of paddy in year 1, 2 and 3 respectively).

*Credit envelope for subsequent phases*

4. During the two subsequent program phases, complementary credit lines will provide financing for: (a) the rehabilitation/expansion of 8,000 additional hectares and the creation of 1,900 ha of new diversification schemes; (b) equipment and seasonal credit needed for diversification. Initial estimates indicate a total additional financing need of about 2,000 million UM.<sup>5</sup>

*UNCACEM's credit procedures*

5. A draft Procedures Manual, including exact procedures for long-term loans for irrigated schemes and marketing credit (new banking instruments for UNCACEM), was drawn up by UNCACEM and reviewed by IDA. This draft (which covers all types of credit granted by UNCACEM regardless of the source of financing) has then been finalized and approved by UNCACEM's Board of Directors prior to negotiations. Any subsequent change in the Procedures Manual will require IDA's non-objection.

*Onlending*

6. The line of credit will be onlent by the Government to UNCACEM in local currency at a rate of 6%, which covers IDA's credit costs, the Government's management expenses and the foreign exchange risk assumed by the Government. The credit will be reimbursed in annual tranches, with each tranche reimbursed by UNCACEM over ten years, with a 2-year grace period during which only interest due will be payable.

7. The Central Bank of Mauritania will exercise *ex-post* monitoring of UNCACEM's use of the line of credit and of its respect of established loan procedures. The Bank's non-objection will be required for the first five irrigated scheme loan dossiers, as well as for all dossiers for loans exceeding 10 million UM each.

*Conditions met by UNCACEM or agreed upon*

8. *Prior to negotiations* (May 1999), UNCACEM has (a) established a provisional operating account, balanced and ready for the coming fiscal year (FY 2000) and adequate for its operational self-sufficiency<sup>6</sup>; (b) defined the interest rates needed to achieve financial equilibrium for FY 2000, and set credit rates for the upcoming cropping season (rainy season 1999/2000) at a level required for its operational self-sufficiency by 2000, and in accordance with its own internal procedures (decision of the Board of Directors). Detailed calculations concerning the provisional operating account and interest rates have been submitted to IDA, which deemed them realistic and acceptable.

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<sup>5</sup> Estimate to be refined by the end of Phase I, based on the financing needs of banks that are beneficiaries of the line of credit.

<sup>6</sup> Operational self-sufficiency is defined as a volume of banking revenues at least equal to operating costs, plus a provision for loan losses.

9. UNCACEM must have achieved operational self-sufficiency by 2000 and financial self-sufficiency<sup>7</sup> by 2001. From the outset of the program, the new banking instruments planned under the IDPIAM (long-term loans and marketing credit) must, in particular, support interest rates compatible with the goal of financial self-sufficiency.<sup>8</sup>

10. UNCACEM has settled its client accounts included in the balance sheet for FY 1998, in accordance with the recommendations of the external auditing firm. Audit reports on fiscal years 1996 and 1997 have been completed, and the audit for FY 1998 will be carried out in June 1999.

## **B. Subsidies**

11. The IDPIAM-IDA will finance targeted subsidies for various types of beneficiaries, under the following conditions:

*a) Subsidies to cooperatives for the rehabilitation/extension of existing schemes and the development of new diversification schemes:*

12. Regularly constituted cooperatives in possession of a land tenure legal document can be eligible to subsidies for the rehabilitation/extension of their schemes or the development of new non-rice schemes. These cooperatives must also be eligible to credit as subsidies will be in the form of grants to match such credit and the personal contribution of the cooperative. For the extension of existing schemes, access to subsidies will be limited to cooperative schemes with average individual farm sizes under 2 ha. For new developments, only non-rice schemes with a maximum size of 5 ha will be eligible for subsidies. This subsidy is justified on the following grounds:

- poverty alleviation strategy: farms of this size, partially geared to household food needs, cannot muster the cash flow needed to reimburse the entire cost of rehabilitation or new creation over an 8-year period, which is considered by banks to be the minimum acceptable term (although the lifespan of the infrastructures is 20 years); and
- environmental concerns: the establishment of environmental standards implies the creation of a drainage system which represents an added cost for the farmer.

13. The subsidy will cover 100% of the cost of the technical study and subsequently, 100% of works oversight costs and 50% of the cost of works (excluding pumping equipment), provided that the study confirms the operation's feasibility and the credit agency accepts the credit application. Based on the estimated cost of works for a medium-sized scheme, the average subsidy would amount to 200,000 UM/ha for rehabilitations and rehabilitation/extension, and 209,000 UM/ha for new developments. The subsidy may not exceed 250,000 UM/ha and 10 million UM per dossier.

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<sup>7</sup> Financial self-sufficiency is defined as a volume of banking revenues adequate to cover operating costs, the provision for loan losses, the actual cost of resources, and return to capital at market rates (around 16%).

<sup>8</sup> According to financial projections made by the final preparation mission, the average interest rates needed for self-sufficiency are close to market rates (i.e., rates offered by commercial banks to their best clients.)

*b) Subsidies to individual farmers for rehabilitation of existing schemes or the development of new diversification schemes*

14. The subsidies will be available to individual farmers for the following purpose and under the following conditions:

- the farmers must be considered eligible to credit by UNCACEM;
- the proposed investment must be considered economically sustainable by UNCACEM and by the Grant Committee;
- the farmer owns less than 40 ha of irrigable land in total;
- the subsidy must be for the rehabilitation of a maximum of 40 ha of existing rice production scheme or for the development of a maximum of 5 ha of new diversification scheme.

15. The subsidy to individually-owned schemes is justified by environmental protection concerns, since the establishment of environmental standards implies the construction of a drainage system that represents an additional expense for the farmer. The subsidy will also constitute a measure of small agricultural enterprise promotion. Finally, it will be a means of promoting a new, sustainable type of irrigated scheme (previous schemes, built hastily and without subsidies, have poorer technical performance and shorter lifespan).

16. The subsidy will cover 80% of the cost of the technical study. Subsequently, it will cover 80% of the cost of works oversight and 20% of the cost of works, provided that the study confirms the operation's feasibility and the credit agency accepts the loan application. Based on the estimated cost of works, the amount of the subsidy for a medium-sized scheme would average 93,000 UM/ha for rehabilitations and 99,000 UM/ha for new developments. The subsidy may not exceed 150,000 UM/ha and 5 million UM per beneficiary.

*c) Subsidy for construction of storage warehouses by SPOs*

17. This subsidy will be made available to cooperatives and cooperative unions receiving long-term credit for the construction of such warehouses. The subsidy is justified, as in the case of the rehabilitations, by poverty alleviation considerations, since cooperative members and unions cannot generate the personal contribution required by the usual rules of sound banking practice. The subsidy would amount to 30% of the cost of the investment or 1.2 million UM on average for a typical warehouse with a capacity of 200 tons.

*d) Subsidy for pilot diversification operations and new irrigation techniques*

18. Under Phase I, pilot activities are planned under the diversification component: establishment of collection points and a collective processing plant equipped with refrigeration, creation of pilot units for vegetable drying and artisanal fruit juice production, marketing and packaging tests for new products, promotional activities and market prospecting trips. Pilot activities are also planned in connection with new types of pumps and new irrigation techniques (e.g., drip hoses.)

19. These activities, which are to be carried out by private operators (individuals or cooperatives) with the support of the IDPIAM, will be subsidized to varying extents ranging from 25% to 75%, depending on the type of beneficiary (individual or cooperative) and the level of risk associated with each

activity. The subsidy is justified in this case by the innovative nature of the proposed activities, and by the technical and commercial risk involved (and which makes the project ineligible for bank credit).

*Total amount of subsidies planned under Phase I*

20. The total amount of subsidies is estimated as follows:

Subsidy (matching grant) for irrigated schemes	Millions UM
<i>Cooperative schemes</i>	245
<i>Non-cooperative schemes</i>	108
Subsidies for cooperative warehouses	42
Subsidy for pilot diversification activities	195
<b>Total</b>	<b>590</b>

*Management of subsidies*

21. Subsidy awards are decided by a Grant Committee consisting of one representative from the MAED (committee president), the CU/IDPIAM, the DEAR, and the land registry office, one farmers' representative, and an agricultural economist assigned by MDRE.

**C. Processing of Credit and Subsidy Applications for Irrigated Schemes**

22. Dossiers to be submitted to UNCACEM and the technical committee in charge of subsidies will include: an administrative file (including administrative documentation confirming that the applicant meets the general eligibility criteria), a technical file (technical and environmental studies), an economic and financial file (feasibility study and rate-of-return estimates), and a file containing an assessment of the applicant's managerial capacities.

23. The application processing procedure is summarized chronologically as follows (in the event that the investment in question is eligible for a subsidy):

- the cooperative (supported, if necessary, by a consulting entity) or non-cooperative farmer applicant submits a preliminary application to UNCACEM;
- UNCACEM assesses the client's eligibility (which involves, particularly in the case of cooperatives, a diagnosis of its organizational capacities) and issues, if applicable, a preliminary financing agreement and hands the dossier on to the committee;
- the main contractor for the technical study is chosen by the applicant, from a list of State- and UNCACEM-approved consulting firms;
- the Grant Committee examines the dossier and makes a decision on financing the technical study;
- the study is approved by an oversight entity (which may be SONADER) jointly mandated by the Government and UNCACEM;
- UNCACEM states its intentions regarding the financing of the project, subject to the dossier's acceptance by the committee, and hands the dossier on to the committee; and
- the Grant Committee announces its decision on the award of the subsidy.

24. For any irrigated scheme investment receiving a matching grant, the obtention of a loan must be accompanied by a signed development contract between the client, UNCACEM, the agency in charge of

support to the farmer, and the IDPIAM, which clearly states the obligations and commitments of each party.

25. Once the loan and subsidy have been obtained, and after payment by the beneficiary of the personal contribution (if applicable), the firm to be charged with performing the work will be selected on the basis of competitive bidding (in which only firms jointly approved by the Government and UNCACEM may participate). Works oversight will be handled by the firm acting as main contractor. Performance monitoring is handled by the monitoring entity.

26. UNCACEM and the Grant Committee will make payments to firms, each for its respective portion of project financing. The committee will entrust fiduciary management of subsidy funds to a local commercial bank.

27. For investments not eligible for matching grants, UNCACEM alone will process the applications, in accordance with the procedures outlined above.

**Summary of Investment Financing Conditions**

	<b>Cooperatives</b>	<b>Non cooperatives</b>	
		with less than 40 ha	with over 40 ha
<b>Schemes</b>			
Maximum amount of subsidy	10 million UM 250 000 UM/ha	5 million UM 150 000 UM/ha	No
Maximum amount of credit	6 million ULM	10 million UM	10 million UM
<b>Rehabilitation</b>			
Subsidy	100% studies and oversight 50% works	80% studies and oversight 20% works for less than 5 ha	No
Personal contribution	10% (in kind)	10% (in cash)	Minimum 30% (cash or kind)
Credit	maximum 40% of the investment (other than studies and oversight)	maximum 70% of the investment	Maximum 70% of the investment
<b>Expansion</b>			
Subsidy	100% studies and oversight 50% works	no	No
Personal contribution	minimum 10% (in kind)		
Credit	maximum 40%	no	No
<b>Creation of non-rice schemes</b>			
Subsidy	100% studies and oversight 50% works	80% studies and oversight 20% works	No
Personal contribution	10%	10%	Minimum 30%
Credit	Maximum 40% of the investment (other than studies and oversight)	Maximum 70% of the investment	Maximum 70% of the investment
<b>Warehouse construction</b>			
Subsidy	30% of works	No	No
Personal contribution	Minimum 10% (in kind)	Minimum 30%	Minimum 30%
Credit	Maximum 60%	Maximum 70%	Maximum 70%

**Financing for irrigated schemes in an intermediate situation (UM)**

	Cooperative		Non cooperative (< 40 ha)		Non cooperative (> 40 ha)	
	rehabilitation/ extension	Creation	Rehabilitation	Creation	Rehabilitation	Creation
Cost/ha						
Study and oversight	40,179	38,123	39,130	38,123	39,130	38,123
Works	317,787	341,230	310,544	341,230	310,544	341,230
<b>Total</b>	<b>357,965</b>	<b>379,353</b>	<b>349,675</b>	<b>379,353</b>	<b>349,675</b>	<b>379,353</b>
Subsidy/ha						
Of studies and oversight	40,179	38,123	31,304	30,498	0	0
Of works	158,893	170,615	62,109	68,246	0	0
<b>Total</b>	<b>199,072</b>	<b>208,738</b>	<b>93,413</b>	<b>98,744</b>	<b>0</b>	<b>0</b>
Personal contribution/ha	35,797	37,935	34,967	37,935	104,902	113,806
Credit/ha	123,097	132,680	221,294	242,673	244,773	265,547

**ESTIMATED COSTS OF PHASE I OF THE PROGRAM**  
Mauritania: Integrated Development Project for Irrigated Agriculture

COMPONENTS	COSTS (US\$ '000)		
	Local	Foreign	Total
<b>A. DEVELOPMENT OF A POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK</b>			
1. Improvement of the policy and legal framework	207	473	679
2. Strengthening of institutional capacities			
Support to MDRE	250	234	484
Support for an agro-pastoral information system	651	420	1,072
Support to SONADER	423	133	557
Support to UNCACEM	188	446	633
Subtotal Strengthening of institutional capacities	1,512	1,233	2,746
<b>Subtotal DEVELOPMENT OF A POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK</b>	<b>1,719</b>	<b>1,706</b>	<b>3,425</b>
<b>B. DEVELOPMENT OF BASIC INFRASTRUCTURES</b>			
Public Infrastructure (hydraulics, commun./roads)	284	1,172	1,456
Rehabilitation / extension / creation of private irrigated schemes	4,445	4,093	8,538
Research and Development	1,039	872	1,910
<b>Subtotal DEVELOPMENT OF BASIC INFRASTRUCTURES</b>	<b>5,768</b>	<b>6,137</b>	<b>11,905</b>
<b>C. SUPPORT TO FARM MANAGEMENT AND ORGANIZATION</b>			
Support for farm management	279	742	1,020
<b>Subtotal SUPPORT TO FARM MANAGEMENT AND ORGANIZATION</b>	<b>279</b>	<b>742</b>	<b>1,020</b>
<b>D. SUPPORT TO TRADITIONAL CROPS SUBSECTOR</b>			
Support for traditional crops	5,698	4,797	10,495
<b>Subtotal SUPPORT TO TRADITIONAL CROPS SUBSECTOR</b>	<b>5,698</b>	<b>4,797</b>	<b>10,495</b>
<b>E. DIVERSIFICATION PROMOTION</b>			
Development of Infrastructure	1,457	1,076	2,533
Diversification promotion antenna	1,795	765	2,560
Diversification promotion activities	716	1,489	2,205
Quality control	45	55	100
<b>Subtotal DIVERSIFICATION PROMOTION</b>	<b>4,014</b>	<b>3,385</b>	<b>7,399</b>
<b>F. ENVIRONMENTAL IMPACT MITIGATION MEASURES</b>			
Environmental monitoring/evaluation	473	513	987
Land use plans	506	159	664
Development of norms	22	22	44
Environmental impact mitigation measures	428	675	1,102
<b>Subtotal ENVIRONMENTAL IMPACT MITIGATION MEASURES</b>	<b>1,429</b>	<b>1,369</b>	<b>2,797</b>
<b>G. PROJECT MANAGEMENT AND MONITORING &amp; EVALUATION</b>			
Project management	1,487	1,219	2,706
Monitoring and Evaluation	443	412	855
<b>Subtotal PROJECT MANAGEMENT AND MONITORING &amp; EVALUATION</b>	<b>1,930</b>	<b>1,632</b>	<b>3,561</b>
<b>H. PROJECT PREPARATION</b>			
-	-	1,300	1,300
<b>Total BASE COSTS</b>	<b>20,835</b>	<b>21,067</b>	<b>41,903</b>
Physical contingencies	594	637	1,231
Price contingencies	1,673	1,218	2,891
<b>TOTAL PROGRAM COSTS (PHASE I)</b>	<b>23,102</b>	<b>22,923</b>	<b>46,025</b>

## **COST BENEFIT ANALYSIS SUMMARY**

### **Mauritania: Integrated Development Project for Irrigated Agriculture**

1. The development objective of the IDPIAM (Integrated Development Program for Irrigated Agriculture) is to increase rural value added, income and employment in the Senegal River Valley by promoting more effective use of this desert country's most valuable assets: the valley's water and arable land. The IDPIAM will also have indirect effects beyond the Valley by (a) generating employment and income upstream and downstream of agricultural production (input supply, establishment and maintenance of infrastructures, repair and maintenance of equipment, processing, transport and marketing of produce, exports); (b) supplying agricultural produce (both traditional and new) to consumers at reasonable prices; and (c) improving the country's trade balance through a reduction in agricultural imports and the development of exports. The creation of employment and income in the Valley will help slow rural migration towards the cities, where unemployment is causing serious social concerns. The IDPIAM will, therefore, have a positive impact on poverty alleviation.

2. Detailed cost-benefit analysis is carried out for income-generating land investments. Although it is not quantified, the economic justification of the social investments (wells and public health services) and rural infrastructures (small bridges and culverts) is very strong.

#### **I. Linkages to CAS and Macro-sectoral Framework**

3. The Government's central objective is to reduce poverty through accelerated, private sector-led growth. The strategy for attaining this objective consists of: (i) assigning the rural sector a larger role within the economy; (ii) developing basic infrastructure; (iii) promoting private sector development; (iv) improving the environment for employment creation and poverty reduction; and (v) restructuring and modernizing the public sector. The general objective of the CAS is consistent with this strategy and is "to help Mauritania achieve rapid, sustainable and equitable growth, to create employment and thus reduce, in absolute terms, the number of Mauritians living in poverty."

4. In this strategy, the rural sector is considered a major source of employment creation and income-generation. With assistance from the Bank and other donors, and with the participation of major stakeholders, the Government recently developed a Rural Development Strategy (RDS) that received the support of the donor community (Consultative Group, March 1998). This strategy has four objectives: (i) promote the growth of a diversified and competitive agriculture; (ii) integrate the livestock sector into the national economy; (iii) promote employment and alleviate poverty; and (iv) reduce the degradation of natural resources.

5. The program proposed for the irrigated sector is an important step towards the implementation of this RDS. (In the rainfed areas, the Bank is already supporting the Rainfed Natural Resources Management Project, whose objective is to control and reduce the spiral of poverty in those areas.) The main element in this strategy is the IDPIAM, which is to be financed by the donor community. The CAS supports the Government's long-term strategy for the rehabilitation of irrigated agriculture and the provision of basic rural infrastructures in the Senegal River Valley. The proposed IDPIAM-IDA is part of this overall program and is thus consistent with CAS objectives.

6. Macro-economic and sectoral pre-conditions are satisfactory for the program. Since 1985, macro-economic performance (foreign exchange liberalization and streamlining of the trade regime) has improved. Initiated in the 1990s, the Government's effort to reorient public resources to the social sector, education and health services has significantly improved social welfare. A major achievement of this effort has been a drop in the poverty rate from 57% to 50% between 1990 and 1996. However, while

poverty was decreasing in the urban centers (28%), it was increasing in the countryside (68%) despite an impressive rate of growth in the rural sector (4.2%).

7. The main policy and institutional reforms being prepared or considered to support the program are the following: (i) a simplified and transparent agricultural tariff policy taking into account the fact that domestic taxes applied only to imported products increase the overall taxation of imports; (ii) the elimination of quota arrangements between paddy marketing and rice imports; (iii) liberalization of transport services; (iv) continued enforcement of land tenure law, with adequate safeguards and a monitoring system; (v) a clear incentive structure (including a credit systems, a transparent framework for investment subsidies, and the implementation of measures regarding savings and loan institutions, in accordance with recommendations concerning the reform of the banking sector); and (vi) the development, within the Ministry of Rural Development and Environment (MDRE) a capacity for strategic planning, policy analysis, monitoring and evaluation, agricultural statistics and information, and coordination/cooperation. The progress and success of these reforms will be the triggers from the first to the second phase of the APL.

8. The Government is to be commended for its commitment to liberalize the rice and transport sectors and to continue implementation of land tenure rules and regulations, as is clearly indicated in the just agreed-upon 1999-2002 policy framework paper (PFP). UNCACEM has also committed itself to an interest policy in order to achieve operational and financial self-sufficiency by 2001. The Government has issued a Letter of Development Policy for the irrigated sector (Annex 11) that operationalizes these measures.

## **II. Analysis of Alternatives**

9. The approach chosen is an integrated and participatory rural development program approach. This approach has the advantage of being holistic, as it takes into consideration all the issues involved. It has the disadvantage, however, of being difficult to grasp and implement. Because it strives to be participatory, it cannot present at the outset an elaborate blueprint for work programs and investments, since the program is supposed to be designed as it is put in place and as the various stakeholders take things in hand. The approach is therefore flexible and iterative.

10. Four other alternatives were considered, but then rejected, as they were judged inferior to the approach ultimately chosen.

11. The first alternative was another project of the small irrigated scheme, or irrigated village scheme type, with subsidies for scheme rehabilitation and assistance to producers in the areas of management and production techniques, with a view to reducing poverty. This formula was rejected since rehabilitation in itself does not resolve issues related to marketing, competitiveness and long-term financing.

12. The second alternative considered providing short-, medium- and long-term credit lines at market rates and allowing private initiative to take its course. This would have resulted either in underutilization of financial resources if the credit institution were to behave with the required prudence, or in bankruptcy if this institution were to respond to credit requests hastily and without in-depth examination.

13. The third alternative envisioned was a series of small sub-sectoral projects, each dealing with one aspect of the problem. One advantage of this formula would have been simpler projects to manage. The drawbacks would have been: the problem and the expense of coordination among numerous projects; the waste of human resources for the preparation and management of several projects; and the absence of any guarantee that all projects would receive support and be implemented at the required time. Experience

has shown that coordination among projects is one of the biggest difficulties, especially when they are financed by different donors.

14. The fourth alternative was a hybrid sector adjustment/investment operation such as the preceding AGSECAL. The disadvantage of this approach is that the adjustment measures are not sufficiently linked to the investment operation itself, and that these measures are often taken to satisfy the requirement of rapid disbursement rather than as proof of true government commitment to the proposed reforms. In addition, rapidly disbursed funds under sectoral adjustment operations do not necessarily benefit the sector for which they are theoretically intended.

#### Rationale for the APL option

15. Before embarking upon an ambitious and costly long-term investment program, Mauritania must: (i) strengthen and maintain an enabling policy environment in the areas of tariffs, transportation services, land tenure and rural finance; (ii) demonstrate the success of new technologies and new crops; (iii) develop the base for economically sustainable crop production; (iv) bring farmers up to a satisfactory level of technological know-how and organization; (v) scout markets to identify commercial niches; and (vi) launch feasibility studies for future major infrastructure works that will require users to contribute to cost recovery. These demands justify the phased approach that an APL offers. Also, the investments that the Government and private sector must make are long-term investments that require long-term commitment on the part of all partners, including donors. These investments are also part of the overall IDPIAM which spans a period of ten years and involves several donors. This overall program is part of the Government's Rural Development Strategy which has been approved by the donor community. Finally problems of poverty alleviation do not have short-term solutions.

16. The proposed long-term APL program: (i) is linked to long-term (6-10 year) activities (infrastructures); (ii) provides financing for a long-term development strategy (11 years), starting with an initial set of activities and using triggers and agreed-upon objectives; (iii) is made up of discrete, divisible and progressive investments with physical objectives for rehabilitation over a long time period; (iv) is characterized by a logical sequencing of interventions and a scheduling of activities determined by triggers and policy requirements; and (v) is based on a programming and cost-benefit rationale that can be verified using generally recognized economic parameters, such as improved yields, greater cropping intensity and diversification.

### **III. Rationale for social investments and construction of small bridges/culverts**

#### **Wells and primary health interventions**

17. The provision of wells, and the primary health activities to be undertaken under the Health Sector investment Project (see Annex 2-F), will help reduce the incidence of waterborne illness and the drudgery of the women's watercarrying chore. These activities are highly cost-effective, costing less than US\$ 100 per Disability-Adjusted Life-Year (DALY) saved (reference Health Sector Investment Project in Mauritania and *Better Health in Africa*). Lessons learned from BHA show that such services, beyond their very high efficiency, have also reduced hospital admissions in certain African communities by almost 50%. The services thus created affect a wide segment of the population in the program area.

#### **Small bridges/culverts on access roads**

18. Phase I of the program will finance small bridges and culverts in the Gani Dar El Barka area, as well as the studies needed for the construction of the roads themselves, which is planned under Phase II. This area between Rosso and Boghé has great promise but cannot fully exploit its potential because of its

inaccessibility. The need for access roads is generally acknowledged, especially by the rural population. However, even though the public usefulness of these rural roads is not at issue, their maintenance can present problems unless the respective roles of local populations and public services are clearly defined. Studies proposed under Phase I will determine more precisely the feasibility of building these roads and will clarify the population's role in, and contribution to, their maintenance. In the meantime, to avoid continually penalizing the area's population, the program will finance the most urgently needed items, namely, small bridges and culverts to partially reduce their isolation.

#### IV. Cost-benefit Analysis

##### Introduction

19. Cost-benefit analysis was carried out for the infrastructure component involving irrigated schemes under Phase I of this APL program (Table 1). Only real/direct measurable benefits were taken into account, but there are other indirect benefits that will help improve the program's economic return. (For example, support to producers will improve production and incomes, not only on irrigated schemes financed under the program, but on other schemes as well. Improvement in the policy environment and institutional capacities will benefit all producers in the Valley.) Since investments are to be demand-driven, the type, size and siting of the schemes are not known beforehand. The analysis is therefore illustrative; it will be taken up again during program implementation, as requests come in, in order to ensure that the program only finances financially and economically viable activities. Although illustrative, the analysis conforms as closely as possible to real conditions as it considers 13 production systems (out of a possible 36) based on the following stratification: type of intervention (rehabilitation, rehabilitation + extension, new creation), type of production system (rice only, rice + vegetables + wood, vegetables only), type of producers (collective, individual), and region (Trarza, Haut Fleuve). In the case of the rice + vegetables + wood production system, each crop is cultivated on a separate plot but they all use a common irrigation system. The average farm size is 40 ha for rehabilitation, as well as for rehabilitation + extension, and 5 ha for new scheme creations. A total of 3,100 ha is anticipated during Phase I.

**Table 1: Present value of flows at 12% for the 3,100 ha under Phase I**  
 [For activities with benefits measured in monetary terms ]  
 (1 \$US = 205 UM, US\$ million, base year: 1999)

	UM\$ Millions		US\$ Million	
	Economic analysis	Financial analysis	Economic analysis	Financial analysis
<b>Benefits</b>				
Incremental operating income	2.376	3.096	11.6	15.1
<b>Costs</b>				
Incremental investment costs	-1.061	-1.261	-5.2	-6.2
<b>Net benefits</b>				
Incremental net benefits	1.315	1.835	6.4	9.0
<b>IRR</b>	28.4%	28.5%	28.4%	28.5%

Note: The difference between economic and financial values of operating revenues represents the producer subsidy equivalent (PSE), which arises from tariff protection. For net benefits, the difference represents the effective producer subsidy equivalent, which accounts for taxes on inputs and equipment.

### **Economic analysis: Summary of costs and benefits**

20. The economic rate of return (ERR) for the typical farm models ranges from 17% (model: rice-only, individual farmer in Trarza) to over 200% (model: vegetables, cooperative farmers in Trarza) with, in between, a rate of 38% (model: rice + vegetables + windbreaks, cooperative producers in Haut Fleuve). Natural protection of the Haut Fleuve (distant from Nouakchott, the point of entry for imported rice) and the use of family labor on collective schemes increase the return on the rice-only model for collective farmers in that region (ERR = 19%). The crop diversification model (rice + vegetables + windbreaks) seems to offer the best large-scale prospects (see Table 2). Based on the anticipated distribution of the selected models and the schedule for rehabilitation works on the 3,100 ha over the first three years of Phase I (which we obviously cannot predict – Table 3), the overall ERR is 28.4%.

### **Key assumptions**

21. The key economic (and financial) assumption is that under the “with project” situation, production and agricultural income (from rice and diversification crops for the local market) will increase relative to what would happen “without the project.” This increase comes from improved design and implementation of irrigated schemes which translates – through better water management – into increased yields, especially for rice (5 tons/ha in Years 2 through 5, and 6 tons/ha thereafter) and greater cropping intensity (1.2 and 1.5, during the same period). Without the project, rice irrigated schemes that are candidates for rehabilitation would see their yields decrease gradually from 3 tons/ha until the abandonment of the scheme in Year 7.

22. The assumption of paddy yields of 5 and 6 tons/ha is reasonable given that current yields of 8 to 9 tons/ha are already observed in the Valley next to much lower yields. Cropping intensities of 1.2 and 1.5 are also observed in Mauritania and are possible with improved water availability and timely cropping practices (short cycle seed, plowing and weeding). One notes that under similar ecological conditions, yet without the support of a holistic program such as IDPIAM, the Senegalese producers’ association in the Delta achieves an average yield of 5.5 tons per ha and a cropping intensity of 1.3. The best producers in Senegal steadily produce yields of 10 tons per ha. The causes of lower rice yields in Mauritania are well known (Annexes 2-B, 2-C, 2-D, and 2-F). In the absence of adequate drainage, salinity can lower paddy yields by 1 ton/ha (Annex 2-B). Thus, better designed and executed irrigated schemes that reduce salinity can be expected to boost paddy yields. Also, the program will study and develop ways for improving existing pumping systems and introducing new equipment in order to reduce pumping costs for irrigated rice in the Delta by at least 20 %. Furthermore, the program has specifically designed component “Support to Traditional Crops” (Annex 2-D) to include a comprehensive package of interventions aimed at improving rice productivity. This component will finance: support to the production of quality seed varieties (IR and Sahel) by CNARADA, with assistance from WARDA and CIRAD; training of extension agents with assistance from WARDA; support to farmers’ organizations to help them plan for timely acquisition of fertilizer; identification of the best producers and their cropping methods, and then farmer-to-farmer visits, including to Senegal, so that others can benefit from their know-how.

23. The assumption for the « without project situation » of decrease in yields leading up to abandonment of irrigated schemes draws from empirical observation in Mauritania. At present, 50% of the established irrigated schemes in Mauritania have been abandoned. It should be noted that the IDPIAM does not involve large, well designed and relatively well maintained public schemes, but instead small village schemes (over 15-20 years old) and individual schemes (more than 5 – 10 years old). These were designed with an expectation that rehabilitation would occur every 2-3 years, but this has not happened even since they went into production. Also some of producers’ organizations in village irrigated schemes have gotten so structurally and organizationally weak that they have ceased all production activities. It is therefore crucial to strengthen producers’ organizations if agricultural

production is to be re-launched in the Valley under the IDPIAM (Annex 2-C). As early as 1994, SONADER diagnosed that rehabilitation was crucial for the great majority of these village and individual irrigated schemes that were still in production. It is this awareness of the poor utilization of irrigation potential and the abandonment of schemes that has prompted Mauritania and its development partners to make the rehabilitation of existing schemes a first priority.

24. Diversification crops for the local market (vegetables, wood from windbreaks), along with the income that producers derive from them, will increase because producers will have greater access to credit and agricultural services which, up to now, have been reserved exclusively for rice cropping. One of the distinguishing features of the IDPIAM will be that it eliminates the distortions favoring rice, especially where credit is concerned, so that producers have more incentive to produce other, more profitable crops.

25. The parity price for rice rests on an assumed constant price of US\$ 250/ton in cost + freight (US\$ 200 F.O.B. Bangkok). Because of the liberalization of the rice sector and its accompanying measures (Annex 2-A), the quality of local rice improves and its discount vis-à-vis imported rice is reduced to only 10% from the 20% noted up to now. Milling rate likewise increases from 62% to 65% (as in neighboring Senegal). One could also have hypothesized product differentiation in local rice (long grain "Caroline" rice, medium grain and broken rice), as is contemplated by rice processors, whereby a high premium placed upon the high-quality and preferred "Caroline" results in higher average paddy prices. Production costs include operation and maintenance (O&M) costs only on the irrigated schemes. The current distribution of producers who could benefit from the program under Phase I indicates that Phase I will only support producers using their own water distribution systems – drawing water either directly from the river or from one of its tributaries. In other words, these producers do not depend on a public distribution and drainage infrastructure for which they would have to pay their O&M charges.

#### **V. Sensitivity analysis/Switching values of critical items**

26. The sensitivity analysis is based on estimated switching values, or changes in the values of key factors that reduce the ERR to 12%. (The rate of 12%, which is taken to be the long-term opportunity cost of capital in Mauritania, should be considered at the "high end" for a poor and heavily indebted country like Mauritania). Results indicate that the risk of non-realization of the program's economic benefits could come from decreased paddy yields, lower paddy prices, or an appreciation of the Ouguiya (Table 2). These risks are highest for individual rice-only farmers in Trarza: switching values are -9% for paddy yields and -12% for paddy prices.<sup>1</sup> For the models as a whole, economic benefits are less sensitive to an increase in the cost of investments that would occur at the beginning of the 20-year lifespan of the scheme. The sensitivity analysis also shows that the benefits of diversified cropping systems, and especially of vegetables-only systems, are less sensitive to a drop in the price of one of those crops. (Note here that "> -50%" in Table 2 means that the decrease is greater than 50%).

27. To mitigate the risk of a drop in paddy yields, the program will require better design of schemes and will support greater access to credit and better agricultural services, including farmer-to-farmer visits and other elements of the comprehensive package of interventions aimed at improving rice productivity (paragraph 22). Since rice cropping is not dependent on Mauritania's uncertain rainfall, the risk of decreasing yields is mainly attributable to those three elements.

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<sup>1</sup> Note that individuals in Trarza would achieve the same economic return with an 11% increase in the price of paddy (due to differentiation and the improved quality of local rice), coupled with yields of 6 tons and a cropping intensity of 1.3 (at full development). This productivity is barely superior to that of the average producer on a self-managed schemes in Senegal (paragraph 22). In other words, the switching value of -9% would be equivalent to the average performance achieved on average in these schemes, a yield of 5.5 tons and a cropping intensity of 1.3.

28. World prices for rice have recently risen because of unfavorable climatic conditions (such as El Niño) and the financial crisis in Asia. World Bank projections for Thai 5% rice (the only type monitored by the Bank for this purpose) are for a price of US\$ 267/ton in 2010. This would translate into a price of US\$ 231/ton for Thai A1 super (a discount of 20%) and US\$ 240/ton for A1 super fragrant (a discount of 10%), which is the most popular kind in Mauritania. These levels remain above the base price of the cost-benefit analysis (US\$200 F.O.B.). However, the world price of rice may undergo significant fluctuations. The program cannot control these fluctuations, but it will help buffer their impact on farmers' incomes by encouraging them to diversify and reduce their dependence on rice. The program will also develop an information system to keep farmers better informed of market conditions.

29. Regarding foreign exchange risks, Mauritania, the IMF and the Bank have embarked upon a program to stabilize exchange rates, among other economic aggregates.

**Table 2:**  
**Cost-Benefit Summary and Risk Analysis Using a Farm Model (Preliminary results)**

	Trarza: cooperatives			Haut Fleuve: Cooperatives		Trarza: Individuals		Haut Fleuve: Individuals	
	Rice	Vegetables	Diversification	Rice	Diversification	Rice	Diversification	Rice	Diversification
<b>IRR: Financial</b>									
Rehabilitation	20%		37%	21%	36%	19%	29%	20%	29%
Rehabilitation + extension	20%		37%	21%	36%				
New creation		> 100%							
<b>IRR: Economic</b>									
Rehabilitation	20%		38%	21%	37%	17	28%	19%	28%
Rehabilitation + extension	21%		39%	22%	38%				
New creation		> 200%							
<b>Switching values (financial)</b>									
<i>Declining prices</i>									
Rehabilitation	-15%		> -50%	-19%	> -50%	-15%	> -50%	-18%	-50%
Rehabilitation + extension	-14%		> -50%	-17%	> -50%				
New creation		-50%							
<i>Declining yields</i>									
Rehabilitation	-12%			-14%		-11%		-14%	
Rehabilitation + extension	-12%			-14%					
<i>Increased investment costs (land)</i>									
Rehabilitation	45%		> 100%	> 100%	> 100%	> 50%	> 50%	> 50%	> 50%
Rehabilitation + extension	45%		> 100%	> 100%	> 100%				
New creation		> 1000%							
<i>Appreciation of foreign exchange</i>									
Rehabilitation	22%		not sensible	35%	not sensible	22%	not sensible	33%	not sensible
Rehabilitation + extension	22%			33%	not sensible				

	Trarza: cooperatives			Haut Fleuve: Cooperatives		Trarza: Individuals		Haut Fleuve: Individuals	
	Rice	Vegetables	Diversification	Rice	Diversification	Rice	Diversification	Rice	Diversification
<b>Switching values (economic)</b>									
<i>Declining prices</i>									
Rehabilitation	-20%		> -50.0%	-24%	> -50%	-12%	> -50%	-16%	> -50%
Rehabilitation + extension	-23%		> -50.0%	-26%	> -50%				
New creation		> -50%							
<i>Declining yields</i>									
Rehabilitation	-14%			-17%		-9%		-12%	
Rehabilitation + extension	-18%			-20%					
<i>Increased investment costs (land)</i>									
Rehabilitation	> 50%		> 100%	> 50%	> 100%	33%	> 100%	45%	> 100%
Rehabilitation + extension	> 50%		> 100%	> 50%	> 100%				
New creation		> 1000%							
<i>Appreciation of foreign exchange</i>									
Rehabilitation	37%		not sensible	> 50%	not sensible	15%	not sensible	20%	not sensible
Rehabilitation + extension	43%		not sensible	> 50%	not sensible				

**Table 3:**  
**Illustrative distribution of irrigated schemes (ha)**

	Year 1	Year 2	Year 3	Total
Trarza				
Collective				
<u>Rehabilitation only</u>				
Rice only	15	25	35	75
Rice + vegetables	15	25	35	75
<u>Rehabilitation extension</u>				
Rice only	35	50	90	175
Rice + vegetables	35	50	90	175
Creation				
Vegetables only	20	40	40	100
Individual with < 40 ha				
<u>Rehabilitation only</u>				
Rice only	100	125	225	450
Rice + vegetables	100	125	225	450
Individual with > 40 ha				
<u>Rehabilitation only</u>				
Rice only	300	300	400	1,000
<b>Total Trarza</b>	<b>620</b>	<b>740</b>	<b>1,140</b>	<b>2,500</b>
Haut Fleuve				
Collective				
<u>Rehabilitation only</u>				
Rice only	10	15	25	50
Rice + vegetables	10	15	25	50
<u>Rehabilitation extension</u>				
Rice only	35	50	90	175
Rice + vegetables	35	50	90	175
Individual				
<u>Rehabilitation only</u>				
Rice only	15	25	35	75
Rice + vegetables	15	25	35	75
<b>Total Haut Fleuve</b>	<b>120</b>	<b>180</b>	<b>300</b>	<b>600</b>
<b>GRAND TOTAL</b>	<b>740</b>	<b>920</b>	<b>1,440</b>	<b>3,100</b>

**FINANCIAL ANALYSIS – PROJECT LEVEL**  
Mauritania: Irrigated Development Project for Irrigated Agriculture

1. The financial rate of return (FRR) for representative farm models ranges from 19% (model: rice-only, individual farmers in Trarza) to over 100% (model: vegetables, collective farmers in Trarza) with, in between, a rate of 37% (model: rice + vegetables + windbreaks, collective farmers in HautFleuve). For the vegetable model, it should be noted that the FRR is lower than the ERR because, while there is little distortion in vegetable growing, the economic cost of rehabilitation is lower than its financial value. As with the economic analysis, crop diversification is the best large-scale prospect. Overall, the program's net financial benefits are substantial for the 3,100 ha to be developed under Phase I, as illustrated by the net present value (NPV) and FRR (28.5%).

**Key Assumptions**

2. The key assumption of the financial analysis (aside from improved paddy yields and the parity price for paddy) is a customs tariff of 23%, taken as the long-term overall tax on imported rice. Overall taxation is currently 45%, but it includes, aside from import taxes of 23% (*droit fiscal à l'importation* – DFI—and statistical tax—TST), internal taxes that are applied only to imported rice. The value-added tax (VAT) is 14% and a so-called *impôt minimum forfaitaire* (IMF) 4%. Mauritania is committed to simplifying and reducing its tariffs and to bringing them into line with those of other countries in the region. For 1999, a ceiling of 23% has been set for import taxes (DFI + TST). Also, the Government will carry out a study in view of simplifying the VAT regime and applying the same rate on imported and local rice. However, since neighboring countries (WAEMU, for example) do not apply internal taxes (VAT or IMF) to basic staples such as rice, it is expected that Mauritania will eventually follow suit.

3. It should be noted also that producers will only assume the costs of operation and maintenance (O&M) on their own infrastructures (see section on cost recovery below).

**Sensitivity analysis/Switching values of critical items**

(Table 2 of Annex 4)

4. Financial benefits are subject, with a few variations, to the same risks affecting economic benefits: risk of declining paddy yields (switching value: -11% for rice-only individual farmers in Trarza), declining paddy prices (switching value: -12% in Trarza), and appreciation in foreign exchange (switching value: 15%). They are also relatively insensitive to increases in the establishment cost of irrigated schemes. The impact of a cost overrun on an irrigated scheme is small when it is assessed over the project's 20-year lifespan. However, its short-term effect is harmful since it affects producers' ability to repay their debts (over an 8-year period).

5. Regarding financial benefits, declining paddy prices could result from a decline in world prices or from a general tariff reduction. It should be noted, however, that the impact of overall taxation on prices is muted in part by high local distribution costs, which are mostly fixed. Thus, all other things being equal, a change in overall taxation, for example, from 23% to 15% (i.e. a 35% drop) would lead to a change in the parity price from 31.5 UM/kg to 29.4 UM/kg (i.e. a drop of 7%). It should also be kept in mind that the 23% tax rate is the long-term assumption. With regard to exchange rates, a depreciation makes imported rice more expensive (the increase in input cost is relatively less important). It is therefore an increase in exchange rates (making imported rice cheaper) that would entail a risk of lowered financial benefits from rice production.

6. The sensitivity analysis also shows the crucial importance of increased paddy yields in relation to the “without project” scenario. Risk mitigation measures identified in connection with the economic analysis will have a similar impact on financial benefits. It should also be noted that the financial analysis considers the total cost of the investment before financing. It therefore does not include investment subsidies. For collective producers and individuals with less than 40 ha who are receiving the subsidy, that subsidy will reduce their cash flow problems and therefore the risks identified by the sensitivity analysis.

### **Investment subsidy**

7. The program provides targeted investment subsidies (matching grants) on poverty and environmental grounds (see Annexes 2-A and 2-TS). Without subsidy, the poorest farmers (especially collective farmers with less than 2 ha and who consume a portion of their own production) would have difficulty repaying an investment loan whose duration is much shorter (8 years) than the lifespan of the investment (20 years). Among individuals with less than 40 ha, one finds young managers and newcomers to agriculture who also lack the capital to obtain credit without a matching grant. Subsidies targeted specifically to investments and to defined groups are the most efficient way of bringing about sustained poverty alleviation. An alternative to the targeted subsidies would be a non-targeted monetary subsidy for collectives and small individuals, granted in the hope that they would use the funds for productive and sustainable investment in agricultural production, marketing and processing. However, with non-targeted subsidies of this type – which would also have to be dispensed in a single lump sum or in scheduled payouts – there is no effective way to control and monitor: (i) that beneficiaries are eligible and (ii) that the funds are used for their intended purpose. As far as income-generation by producers is concerned, other alternatives would present only short-term solutions that would keep producers in a situation of aid dependency. The targeted subsidy, as illustrated by the sensitivity analysis above, helps reduce the program’s risks for the poorest farmers.

8. The purpose of the subsidy is also to encourage individual farmers with less than 40 ha and collective farmers to build efficient irrigated schemes, including drainage systems, in order to reduce land degradation. In the past, individual and collective farmers who set up irrigated schemes paid scant attention to environmental problems (salinity, waterlogging) and therefore failed to internalize their costs.

9. The subsidy covers two elements: study of the dossier and supervision of works by the consulting firm (100% for collective farmers and 80% for individuals with less than 40 ha) and the cost of the works themselves (50% on average for collective farmers and 25% for private individuals with less than 40 ha), which is adequate as a guarantee for agricultural loans. For individuals with more than 40 ha, access to a line of credit is deemed necessary to encourage them to carry out schemes in accordance with the technical and environmental standards set up by the Government. The impact of the investment subsidy is discussed in the section on fiscal impact.

### **Cost recovery and O&M**

10. Water users in Mauritania depend on a water delivery system either built by the Government or by themselves. Producers in the first group, such as those on the large irrigated perimeters, also depend on publicly-financed drainage network. Most producers in the second group, on the other hand, use natural water courses for drainage. (Others would need better drainage systems such as the one proposed in Phase II of the program.)

11. Under Phase I of the program, potential beneficiaries will come from the second group, i.e., the group that does not depend directly upon public irrigation and drainage infrastructures. These producers will not be subject to additional charges for recovery of O&M costs of publicly-built schemes and

irrigation systems. (The question remains that irrigation water is still inadequately charged to users. In its Letter of Development Policy, the Government promises to address the issue of water management and charges, which is linked to the issue of land taxes.) Producers will, however, be required to ensure the proper O&M of the irrigation structures on their irrigated schemes. Estimated farm budgets cover all such O&M costs (irrigation infrastructures and equipment), and will be specifically indicated in each farmer's investment credit application.

12. Phase II of the program includes the financing of basic infrastructures, including drainage. Cost recovery for the O&M of these infrastructures will comply with Government policy in this area. Current Government policy is to transfer responsibility for O&M of public irrigated infrastructures to users' associations or cooperatives. For many small collective farms, this transfer occurred much too quickly and resulted in O&M problems on the irrigated schemes. For large public schemes deemed too complex to be immediately handed over to users, SONADER handles O&M on behalf of farmers, but the amount and rate of cost recovery are unsatisfactory. These problems will be addressed under Phase I, and two main triggers will need to be met before basic infrastructure investment can occur under Phase II. The first condition will be that procedures for collecting and managing O & M fees for publicly-financed schemes must have been developed during Phase I. The other condition will be that Government must thoroughly review the regulatory framework of water user associations, with a view to granting them a status for purposes of collecting and managing O&M fees for basic irrigation infrastructure. These measures are incorporated into the Government's Letter of Development Policy.

#### **Financial Summary for Revenue-Earning Project Entities (UNCACEM)**

13. The factors underlying UNCACEM's heavy losses in the past years have been partly internal as well as external to UNCACEM. In its early years of operation, UNCACEM experienced higher levels of loan delinquencies due to factors which can be traced to: (i) Government mandated programs for rice production, and (ii) assumption of a loan portfolio (with substantial arrearages and delinquencies) from a predecessor Government-agency. In this sense, UNCACEM as a private-sector institution was subjected to public sector intervention. The need to make provisions for possible loan losses has contributed substantially to UNCACEM's unfavorable results of operation. In addition, a requirement to make supplemental provisions in conformity with prudential guidelines will adversely affect its financial position and structure. The sensible approach has been for Government and UNCACEM to resolve in 1999 the delinquent portion of its portfolio (which has been identified) once and for all (balance sheet items), so that UNCACEM may be allowed to normalize its provisioning activities (income statement items).

14. The evaluation of UNCACEM, conducted during the preparation phase in compliance with the requirements of OP 8.30, showed in particular a remarkable improvement in UNCACEM's loan recovery performance since 1997, and the need for a substantial increase in interest rates (now well below market rates) in order to achieve operational and financial self-sufficiency.

15. Taking into consideration the incremental activity generated by the program, and assuming substantial yet acceptable increases in interest rates, the financial projections for UNCACEM indicate that it can achieve operational and financial self-sufficiency in year 2001.

**Financial Summary for Revenue-Earning Project Entities**  
**Years Ending 1996 through 2001**  
**(in millions of current UM)**

	1996	1997	1998	1999	2000	2001	Average annual growth <sup>1</sup>	
	Actual			Forecast			1996-2001	1999-2001
<b>Income statement items</b>								
Operating income	128	98	107	108	183	254	15%	53%
Operating expenditures	101	101	101	111	114	123	4%	5%
Cost of funds				18	46	64		89%
Provision for bad loans <sup>2</sup>	78	107	38	5	9	13	-30%	53%
<i>Net profit</i>	<i>-51</i>	<i>-110</i>	<i>-32</i>	<i>-26</i>	<i>14</i>	<i>54</i>		
<b>Balance sheet items</b>								
Portfolio	948	1009	1376	1369	1871	2441	21%	34%
Fixed assets	37	34	54	60	70	78	16%	14%
Miscellaneous assets	337	600	100	500	500	600	12%	10%
<i>Total assets</i>	<i>1322</i>	<i>1643</i>	<i>1530</i>	<i>1929</i>	<i>2441</i>	<i>3119</i>	<i>19%</i>	<i>27%</i>
Equity <sup>3</sup>	1041	1291	1310	1311	1351	1401	6%	3%
(of which capital)	(88)	(104)	(130)	(130)	(170)	(220)	(20%)	(30%)
Liabilities (IDA funds)				586	1023	1671		69%
Short term and misc. liabilities	281	352	220	32	67	47	-30%	21%
<i>Total liabilities</i>	<i>1322</i>	<i>1643</i>	<i>1530</i>	<i>1929</i>	<i>2441</i>	<i>3119</i>	<i>19%</i>	<i>27%</i>
<b>Ratios</b>								
Operational self sufficiency <sup>4</sup>	72%	47%	77%	93%	149%	187%		
Financial self sufficiency <sup>5</sup>	66%	44%	67%	70%	93%	108%		

## Notes:

<sup>1</sup> Excel "rate" formula.

<sup>2</sup> Equity includes past government's advances.

<sup>3</sup> Forecast of provision for loan losses is 5% of revenues.

<sup>4</sup> Operational self-sufficiency is defined as a volume of banking revenues at least equal to operating costs, plus a provision for loan losses.

<sup>5</sup> Financial self-sufficiency is defined as a volume of banking revenues adequate to cover operating cost, the provision for loan losses, the actual cost of resources, and return to capital at market rates (estimated average of 16%).

## **Key Assumptions**

16. The underlying main assumptions are that UNCACEM (i) will reduce the high provisions for bad debts on mature loans insufficiently provisioned during the first years of UNCACEM's existence (the auditors' report recommends an additional provision on bad debt, which should be made prior to project implementation); (ii) will reduce its relatively high operating costs, as compared to a reduced level of activity; and (iii) will revise its interest rate policy in order to reach financial self-sufficiency during Project Year 2 at the latest. This latter measure is a condition for implementation.

17. The combination of: (i) resolution and rationalization of the delinquent loan portfolio, (ii) the consequent normalizing of its provisioning for loan losses, and (iii) adjustment in loan pricing (interest rates) geared to attain operating (and subsequently, financial) self sufficiency will place UNCACEM on a path towards self-sustainability. As no private commercial banks have thus far indicated interest in participating as financial institutions for the Project's credit facilities, it is important that UNCACEM be appropriately positioned to demonstrate the viability of lending to the rural sector, and the manageability of risks involved, in order to attract the interest of the private commercial banks in the Project's subsequent Phases.

18. UNCACEM will continue to evaluate and assess the credit risks in the projects submitted to it for financing under the Project. The Project's design adequately provides for appropriate institutional capacity building and strengthening, especially of related project implementation agencies and UNCACEM. Key government agencies involved in the Project, such as MDRE and SONADER will play indispensable roles especially in identifying the eligibility of applicants for the investment subsidy schemes envisioned, facilitating the use of qualified consultants to carry out the feasibility studies providing the counterpart matching grants as subsidy payments. However, responsibility for credit risk assessment and exposure will still rest with UNCACEM.

## **Fiscal Impact on Government finances**

19. A cash flow analysis of Government's inflows/outflows related to the program has been conducted. The program's fiscal impact on Government finances will be positive. The net present value of the investment subsidy will be almost entirely covered by taxes on inputs and agricultural equipment. The net present value of beneficiaries' contributions will also be greater than that of the investment subsidy. This is partially due to the fact that individuals having more than 40 ha have a beneficiary contribution (and pay taxes on inputs and equipment), while having no access to the subsidy.

20. **Inflows.** Inflows will include IDA disbursements, the reimbursement of UNCACEM's line of credit, taxes on inputs and equipment, and Government savings resulting from an end to paddy marketing subsidies. The UNCACEM line of credit (for rehabilitation, agricultural equipment, additional seasonal credit) will be entirely recovered, with 6% interest (Annex 2-ST). The rate of interest on this credit line will cover the service charge on IDA funds (0.75%), the foreign exchange risk and the Government's administrative costs associated with managing the IDA funds. For other fiscal inflows, Mauritania will rely essentially on import taxes, since its tax administration has limited capacity to recover income taxes. The elimination of the paddy marketing subsidy will improve Government's financial situation. The program will give Mauritania a chance to transform costly and inefficient subsidies into needed support for better irrigated schemes and agricultural services.

**Fiscal impact on Government finances**  
**Net present value at 12%**

Cash flow items	UM millions	US\$ millions
<b>Budgetary inflows</b>		
IDA disbursements	6,276	30.6
Government contribution	603	2.9
Reimbursement of UNCACEM	1,063	5.2
Taxes on inputs and production investments	347	1.7
Marketing subsidies saved	2,398	11.7
<b>Total budgetary inflows</b>	<b>10,688</b>	<b>52.1</b>
<b>Budgetary outflows</b>		
Project financing (IDA + Government)	6,880	33.6
Recurrent costs (over 5 years)	298	1.5
Loss of tax revenue on substituted rice imports	619	3.0
Reimbursement IDA	910	4.4
<b>Total budgetary outflows</b>	<b>8,706</b>	<b>42.5</b>
<b>Net fiscal cash flow</b>	<b>1,981</b>	<b>9.7</b>
<b>Amount of investment subsidy</b>		
Matching grants	385	1.9
Beneficiary contributions (Phase I)	586	2.9
Recovery of matching grants through taxes on inputs	0.90	0.90

21. **Outflows.** IDA funds and the Government contribution will finance : (i) the line of credit to UNCACEM; (ii) the investment subsidy; (iii) other matching grants to help finance the construction of small storage units for poor collective farmers and the pilot diversification operation; (iv) agricultural extension and research; and (v) roads and social infrastructures. The Government will also assume the additional recurrent costs of program management and services to farmers, to be phased out over five years after the end of Phase I. (These recurrent costs are estimated net of taxes.) Since additional local rice production substitutes for rice that would otherwise be imported, the Government will forego taxes that it would have collected on the equivalent volume of imported rice. However, this "loss" corresponds to a gain on the part of producers who have increased local production.

22. Budgetary outflows will also include reimbursement of the IDA credit over 40 years, according to the following schedule: 10 year grace period; repayment of 2% of the capital over the 10 years following the grace period, reimbursement of 4% of the capital over the following 20 years. The service charge is 0.75% on the amount of disbursed, and not repaid, IDA funds.

**PROCUREMENT AND DISBURSEMENT ARRANGEMENTS**  
Mauritania: Integrated Development Project for Irrigated Agriculture

**A. Procurement**

1. The program elements, their estimated costs, and the procurement arrangements are summarized in Table A.
2. **All IDA financed civil works, equipment and materials** will be procured in compliance with *IDA Guidelines for procurement under IBRD Loans and IDA Credits*, published by the World Bank in January 1995 and revised January and August 1996, September 1997, and January 1999. Procurement of consultant services and technical assistance will follow the Bank's *Guidelines for the Selection and Employment of Consultants by World Bank Borrowers*, published by the World Bank in January 1997 and revised in September 1997 and January 1999. IDA's standard bidding documents for civil works and goods, and standard request for proposals (see "Selection of Consultants", dated July 1997 and revised in April 1998) will be used for all procurement under International Competitive Bidding (ICB) and for the selection of consultants. IDA's Standard Bidding Documents for works and goods, and Standard Bidding Invitations ("Selection of Consultants", dated July 1997 and revised in April 1998) will be used for all contracts under ICB and for the selection of consultants.
3. **Civil Works.** Procurement arrangements for civil works for public infrastructure, irrigation infrastructure, rural roads, market infrastructures, water and sanitation (totaling US\$ 0.280 million) will be entirely based on National Competitive Bidding (NCB), because civil works contracts will not exceed US\$ 200,000 per contract and are unlikely to attract foreign contractors. ICB is therefore not foreseen for this program, although in the event that any civil works package exceeded US\$ 200,000, ICB procedures would be applied. Contracts for small rural road maintenance works and spot improvement estimated to cost less than US\$ 50,000 per contract, up to an aggregate amount of US\$ 1.925 million, will be procured under lump-sum, fixed-priced contracts on the basis of quotations obtained from three qualified domestic contractors invited to bid. The award will be made to the contractor offering the lowest price quotation for the required work, provided he demonstrates the experience and resources to complete the contract satisfactorily. Civil works contracts for public investments already made by the Government as main contractor (*maître d'ouvrage*) will be administered by a Government agency, the *Société Nationale de Développement Rural* (SONADER).
4. **Contracts for Goods.** Equipment, materials, vehicles, motorcycles, computers, and furniture will be grouped to the extent possible in lots of at least US\$ 100,000. Those exceeding US\$ 100,000 will be awarded on the basis of ICB, using World Bank standard bidding documents for procurement of goods (published in January 1995, revised in January and August 1996, and September 1997). Contracts for office equipment, vehicles and materials locally available which cost less than US\$ 100,000 equivalent, but more than US\$ 30,000 equivalent, up to an aggregate amount of US\$ 0.210 million, will be procured through NCB procedures acceptable to IDA. Small quantities of goods such as office supplies, consumable materials and spare parts, which are normally available off the shelf at competitive prices and which cannot be grouped into packages of at least US\$ 30,000, will be procured through prudent national shopping principles, based on price quotes obtained from three qualified suppliers, provided that the aggregate amount does not exceed US\$ 0.406 million over the entire duration of this phase of the program. As the case may be, contracts for goods up to an amount not exceeding US\$ 100,000 per contract up to an aggregate amount of US\$ 0.425 million may be procured by UN agencies (UNIPAC or IAPSO).

5. **Consultant Services.** Consultant services financed by IDA will normally be selected through competition among short-listed firms for which the selection will be based on quality and cost, by evaluating the quality of the proposal before combining quality and cost evaluation for all bidders obtaining the minimum qualifying marks for their technical proposals. For audits of a standard nature, the least cost method will be most appropriate, and the firm with the lowest price will be selected, provided that its technical proposal received the minimum qualifying marks. Services for small studies and seminars which can be delivered by individual consultants will be selected through comparisons of qualifications among those expressing interest in the assignment or through direct approach, on the basis of work programs and terms of reference, whenever possible from a short-list of individual consultants. Training and advisory services estimated to cost less than US\$ 50,000 will be procured through selection based on the consultants' qualifications. Local support services, such as technical assistance and farmers' training, may be procured through single source selection, provided that the consultant and/or NGO has demonstrated experience and comparative advantage to carry out the tasks.

6. **Short lists** for contracts not exceeding US\$ 100,000 may be comprised entirely of national consultants if a sufficient number of qualified firms (at least three) are available to compete. However, if foreign firms express interest in these contracts, they will not be excluded from consideration. Simplified contracts will be used for short-term assignments (not exceeding six months), carried out by firms or individual consultants.

7. **The Agricultural Line of Credit** funded by IDA will be made available to UNCACEM by the Government at an interest rate that covers all Government's costs, including the IDA lending rate, currency exchange risk and overheads. UNCACEM borrowers who are main contractors for projects receiving financing will follow commercial practices as stated in UNCACEM's Manual of Procedures and acceptable to the Government, and IDA. Commercial practices consist of obtaining price quotes from at least three qualified contractors selected from an approved list prepared by SONADER and provided to borrowers by UNCACEM. UNCACEM will inform borrowers of the approval of the line of credit, and will, at the request of borrowers, make payment to contractors by tranches upon certification of the works by an engineering firm responsible for works oversight, and confirmation by SONADER, the Government's delegated contracting authority.

8. **The Agricultural Promotion Matching Grants** will help small and poor farmers make up their financial deficit for investments they wish to implement on their irrigated schemes, and which they are committed to financing partly from their own resources and partly by means of credit. This assistance is therefore intended to help them maintain a positive cash flow. Matching grants will also be used to help people initiate pilot investments in crop processing and marketing. The use of matching grants will be based on a Procedures Manual prepared by the Government and deemed acceptable by UNCACEM and IDA. The Procedures Manual on credit use and the manual concerning matching grants will be similar in many ways, since the two types of financing will serve for the same investments, although they will have complementary functions. These funds will be managed by the CU/IDPIAM, but the decision to award matching grants will rest with a commission composed of representatives of the Government and the target groups. The disbursement of matching grant funds will follow the same procedures as for the line of credit, after certification of works by the engineering firm and their approval by SONADER.

9. **Funds for the environmental mitigation component** will be used to procure civil works, goods and services for activities aimed at preventing or correcting negative environmental impacts. A committee chaired by the Program Coordinator will review requests made by public services or local communities. The Directorate for Environment and Rural Development (DEAR) of the MDRE will have the mandate for technical pre-review and clearance and for monitoring the implementation of works. Procurement procedures will be those used for other public works under public investments as described above.

10. **Capacity Assessment and Management Arrangements**

During negotiations:

- The Government submitted a draft procurement plan for the first year of the program and provided assurances that standard bidding documents used under NCB procedures for civil works and goods will be submitted for IDA’s approval;
- an agreement was reached on rigorous monitoring of procurement;
- the Government provided assurances that it will: (a) use IDA’s Standard Bidding Documents for ICB and the Standard Bid Evaluation forms; (b) apply the procurement procedures and arrangements outlined in the above documents; and (c) review the procurement plan and procurement arrangements each year at the annual review with IDA; and
- the Government provided assurances that it will take the necessary measures to ensure that procurement phases do not exceed the following target time periods:

<b>Procurement phases</b>	<b>Maximum number of weeks</b>
Preparation of bidding documents	4 (12 for large contracts)
Preparation of bids by bidders	4 (6 - 10 for ICB)
Bid evaluation	2 (4 for large contracts)
Signature of contracts:	2
Payments:	4

Prior to credit effectiveness:

- The capacity to manage procurement (as assessed by the procurement specialist at the Bank’s Resident Mission) must have been judged acceptable by IDA; and
- A procedures manual acceptable to IDA must have been adopted.

During implementation:

- All bidding packages, bid evaluation reports and draft contracts submitted to IDA for examination must contain an updated version of the procurement plan;
- Information on procurement must be gathered and recorded as follows:
  - \* Immediate recording by the borrower of information concerning the contract; and
  - \* The borrower must submit to IDA annual reports indicating: (i) revised cost estimates for individual contracts and for the program as a whole, including best estimates for contingencies; (ii) an updated schedule of projected procurement phases, including deadlines and cost of accomplishing individual procurements; and (iii) that procurement procedures have been adhered to.

11. **IDA reviews.** Prior IDA review (see Table B) will be required for all goods and works contracts valued at more than US\$ 100,000. The prior review process will cover about 70 percent of the total value of the contracts for works and goods. Selective post-review of contracts awarded below the threshold levels will apply to about one in three contracts under SOE reviews carried out by resident mission staff and/or consulting firms. Draft standard bidding documents for NCB will be reviewed and deemed acceptable by IDA. Bank staff will also review the consultant selection process proposed by the

borrower. Prior review by IDA will apply to budgets, short lists, selection procedures, bidding invitations, evaluation reports, and negotiated contracts.

12. Prior review will be required for consultants' services valued at over \$US 50,000 equivalent per contract with firms, and at over US\$20,000 per contract with individuals. All other contracts will be subject to post review. The exception to prior review will not apply, however, to amendments to contracts with firms that would cause the total value of the contract to exceed \$50,000, or to amendments to contracts with individuals that would cause the total value of the contract to exceed US\$10,000, nor would it apply to assignments of a critical nature as determined by IDA. For training in-country or abroad, the training program, including the names of the proposed institutions, names of proposed trainees, estimated costs, course descriptions, duration and dates of courses of study, will be submitted every 24 months to IDA for review. The review process will cover 85 percent of the total value of contracts for consultants' services. Selective post review of contracts awarded below authorized thresholds will apply to about one contract in three each year.

## **B. Disbursements**

### *Allocation of credit proceeds (Table C)*

13. The proposed allocation of credit proceeds is shown in Table C. The IDA credit will be disbursed over a period of forty-four months (from 1999 to 2003), with a closing date of December 31, 2002 and a project completion date of June 30, 2003. All applications to withdraw proceeds from the credit must be fully documented, except for contracts not subject to prior review by IDA. For the rest of the contracts, disbursements will be made against SOEs certified by the head of each executing agency. Supporting documentation will be retained by the executing agencies and made available for review by IDA supervision missions and program auditors.

### *Use of statements of expenses (SOEs)*

14. Requests for fund withdrawals will be properly documented for all expenditures to be paid out of the IDA credit, except for the following contracts, for which disbursements will be made against SOEs certified by the Project Manager: (a) contracts for goods with a unitary value below US\$ 10,000 equivalent; (b) contracts with consulting firms with a unitary value below US\$ 50,000 equivalent, and with individual consultants for an amount below US\$ 20,000 equivalent; (c) additional operating expenses; and (d) training. Documentation of such SOEs will be retained by the CU/IDPIAM and made available, on request, to financial and technical auditors and to IDA supervision missions.

### *Special Account*

15. To expedite disbursements and ensure that project funds will be available as needed, the Government will open a Special Account for each executing agency (for a total of three Special Accounts) at a commercial bank acceptable to IDA. The authorized balances of Special Accounts A (MDRE), B (SONADER), and C (UNCACEM) will be US\$ 1.2 million, 0.8 million and 1.0 million respectively, representing IDA's anticipated share of eligible expenditures for 4 months. Replenishments of the Special Accounts will be made on the basis of monthly applications supported by full documentation of SOEs as required and verified by the CU/IDPIAM's Administrative and Financial Director.

16. The Government will open in a financial institution a Program Account to cover its counterpart contribution to the Program, to be used exclusively to cover expenditures under the program. The Borrower will deposit into the Program Account an initial amount, in Mauritanian Ouguyas, of US\$ 1.0

million equivalent. The opening of this account and the above-mentioned initial deposit will be a condition of credit effectiveness.

*Accounting, and Financial Management*

17. A system of accounting and financial management, based on internationally recognized accounting standards, will be established and operational within the CU/IDPIAM. The recruitment of an administrative and financial director and the putting in place of the accounting and management systems must be done before credit effectiveness. It has been agreed that each of the three executing agencies (CU/IDPIAM, SONADER and UNCACEM) will maintain accounts for the Project operations for which it is responsible and will prepare the corresponding financial statements. The CU/IDPIAM will be responsible for preparing annual consolidated financial statements. All documentation relating to procurement, contracts and invoices will be retained by each agency and made available to supervision missions and auditors.

18. The World Bank has assessed the management systems currently used at the three executing agencies in order to determine if they meet the eligibility conditions for the new LACI disbursement procedures based on quarterly management reports (refer to report on “the evaluation of executing agencies financial management systems” in the project’s files). This assessment concluded that the current systems would probably not furnish timely and accurate information on future program implementation as required by the Bank, as far as LACI disbursement procedures are concerned. Additional interventions will be needed prior to credit effectiveness, and action plans have been drawn up for a period of 21 months with a view to strengthening management systems and introducing the LACI disbursement procedures. In this connection, the Bank will carry out a second assessment of management systems to determine whether conditions for the use of LACI have been met. This assessment will occur at the beginning of the fourth quarter of 2000. Through the end of 2000, the replenishment of special accounts will be made against SOEs. In addition to the financial statements that they must submit each year, the executing agencies will submit quarterly management reports on financial statements, physical implementation and management of contracts for goods, works and consultants’ services.

19. During negotiations, the Government provided assurances: (a) that program financial statements will be audited in accordance with internationally recognized procedures by experienced auditing firms acceptable to IDA. The audit reports and financial statements will be submitted to IDA within 6 months of the end of the Government’s fiscal year; (b) that, in addition to an opinion on the financial statements expressed in their succinct report, auditors will be asked to: (i) review in depth all SOEs and internal control procedures used for their preparation during the period under review, in order to express a separate opinion on them; (ii) review the management and use of the special accounts in order to express separate opinions on them as well; and (c) that, finally, the auditors will carry out a detailed review of the Program’s system of internal controls with a view to identifying its main weaknesses and making recommendations for improvement. The results of this review will be incorporated into a Letter to Management to be submitted to IDA along with the auditors’ reports.

**Table A: Project Costs by Procurement Method<sup>1</sup>**  
(in thousands of US\$)

Expenditure Category	Procurement Method					Total Cost <sup>2</sup>
	ICB	NCB	Other	N.A.	NBF	
<b>A. Civil Works</b>						
Construction of Bridges /a (IDA share)		279 (233)				279 (233)
Other Constructions and Repairs (IDA share)			1,925 (1,604)			1,925 (1,604)
<b>B. Goods</b>						
Vehicles (IDA share)	2,441 (1,649)					2,441 (1,649)
Equipment and materiel (IDA share)	3,206 (2,582)	212 (171)	828 (667)			4,246 (3,420)
<b>C. Specialized Services</b>						
Consultations & Studies (IDA share)			11,141 (10,650)		539	11,680 (10,650)
Supervision (SONADER) (IDA share)			594 (495)			594 (495)
Training (IDA share)			2,110 (2,110)			2,110 (2,110)
<b>D. Funding Private Sector Investments</b>						
Lines of credit (UNCACEM) /b (IDA share)			11,101 (11,101)			11,101 (11,101)
Subsidies /c (IDA share)			2,938 (2,938)			2,938 (2,938)
Beneficiaries Contribution (IDA share)					3,705	3,705
<b>E. Severance pay</b> (IDA share)				322		322
<b>F. Additional operating costs</b> (IDA share)				3,383 (2,642)		3,383 (2,642)
<b>G. Project Preparation Facility</b> (IDA share)			1,300 (1,300)			1,300 (1,300)
<b>TOTAL</b> <b>(IDA share)</b>	<b>5,647</b> <b>(4,231)</b>	<b>492</b> <b>(404)</b>	<b>31,938</b> <b>(30,866)</b>	<b>3,705</b> <b>(2,642)</b>	<b>4,244</b>	<b>46,025</b> <b>(38,143)</b>

\a includes small scattered works at various times and in various locations.

\b IDA contribution to UNCACEM for loans to farmers.

\c IDA contribution in the form of subsidies for private sector promotion.

Note: N.F.B. = Not financed by the Bank (includes items procured under co-financing, consultants' services under trust funds, any restricted procurement, or miscellaneous items). Procurement methods for items designated "other" and details on items designated "NFB" must be explained in footnotes or in the text. Figures in parentheses refer to financing under the IDA credit.

<sup>1</sup> For details on procurement methods, see OM 11.02 "Procurement Methods for Investment Operations." Details on consultants' services may be more easily shown in Table A1 (complement to Table A if needed.)

<sup>2</sup> including contingencies

**Table A-1: Consultant Selection Procedures (optional)**  
(in US\$ million)

Consultant Services Expenditure Category	Selection Method							Total cost (including contingencies)
	QCBS	QBS	SFB	LCS	CQ	Other	N.F.B.	
A. Firms	6.08	-	-	0.26	-	0.59 <sup>3</sup>	-	6.93
B. Individuals	-	-	-	-	6.92	-	-	6.92
<b>Total</b>	<b>6.08</b>	<b>-</b>	<b>-</b>	<b>0.26</b>	<b>6.92</b>	<b>0.59</b>		<b>13.85</b>

Note: QCBS = Quality/Cost-Based Selection  
 QBS = Quality-Based Selection  
 SFB = Selection on basis of Fixed Budget  
 LCS = Least-Cost Selection  
 CQ = Consultant Quality  
 Other = Selection of individual consultants (see Section V of *Guidelines for Selection of Consultants*), Commercial Practices, etc.  
 N.F.B. = Not financed by the Bank  
 Figures in parentheses refer to amounts to be financed from the IDA credit.

<sup>3</sup> SONADER supervision fees (direct agreement between CU-IDPIAM and SONADER)

**Table B: Prior Review Thresholds and Recourse to Different Procurement Methods<sup>4</sup>**

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts subject to prior review/Total estimated value subject to Prior review
	US\$		millions de US\$
1. <u>Civil works</u>	> US\$ 500,000	ICB	US\$ 0.0
	< US\$ 100,000	NCB	US\$ 0.28
	< US\$ 30,000	Quotations	US\$ 0.0
2. <u>Goods</u>	> US\$ 100,000	ICB	US\$ 5.65
	< US\$ 100,000	NCB	US\$ 0.21
	< US\$ 30,000	Quotations	US\$ 0.0
3. <u>Services</u>			
	Firms		
	> US\$ 50,000	QCBS	US\$ 5.20
	< US\$ 50,000	LCS	US\$ 0.26
	SONADER	sole source	US\$ 0.59
	Individuals		
	> US\$ 10,000	CQ	US\$ 5.72
	< US\$ 10,000	CQ	US\$ 0.0
Total value of contracts subject to prior review			<b>US\$ 17.91</b>

<sup>4</sup> Generally, threshold vary depending on countries and projects. Consult OD 11.4 "Analysis of Procurement Documents" and contact the Procurement Adviser for more information.

**Table C: Allocation of Credit Proceeds**

Expenditure Category	Amount (in US\$ millions)	Percentage of financing
(1) <b>Civil Works</b> (a) MDRE (b) SONADER	1,800,000 200,000	100% of foreign expenditures and 90% of local expenditures
(2) <b>Vehicles</b> (a) MDRE (b) SONADER	700,000 600,000	100% of foreign expenditures and 75% of local expenditures
(3) <b>Equipment</b> (a) MDRE (b) SONADER (c) UNCACEM	1,600,000 700,000 100,000	100% of foreign expenditures and 80% of local expenditures
(4) <b>Consultant services and studies</b> (a) MDRE (b) SONADER (c) UNCACEM	5,700,000 4,200,000 300,000	100%
(5) <b>Training</b> (a) MDRE (b) SONADER (c) UNCACEM	1,000,000 1,000,000 200,000	100%
(6) <b>Loans for Subprojects</b>	9,400,000	100% of amounts disbursed
(7) <b>Grants for Subprojects</b>	2,400,000	100% of amounts disbursed
(8) <b>Incremental operating costs</b> (a) MDRE (b) SONADER	2,300,000 600,000	80%
(9) Refunding of Project Preparation Advance	1,300,000	Amounts due pursuant to Section 2.02 (c) of this Agreement
(10) Unallocated	4,000,000	
<b>TOTAL</b>	<b>38,100,000</b>	

**PROJECT PROCESSING BUDGET AND SCHEDULE**  
Mauritania: Integrated Development Project for Irrigated Agriculture

<b>A.</b>	<b>Project Budget (US\$000)</b>	<b>Planned</b>	<b>Actual</b>
	Bank Budget	747	747
	<i>(including FAO/CP)</i>	<i>(332)</i>	<i>(332)</i>
<b>B.</b>	<b>Project Schedule</b>	<b>Planned</b>	<b>Actual</b>
		<i>(At final PCD stage)</i>	
	Time taken to prepare the project (effective months)	24	24
	First Bank mission (identification)	Feb. 1996	Feb. 1996
	IEPS Review Meeting	Feb. 6, 1996	Feb. 6, 1996
	PCD Review Meeting	Sep. 14, 1998	Sept. 14, 1998
	Final Preparation Mission		Oct. 19 –Nov. 04, 1998
	Decision Meeting	Feb. 16, 1999	Feb. 16, 1999
	Pre-appraisal Mission	Nov. 1998	Feb. 21 – March 14, 1999
	Appraisal Mission	Feb. 1999	Feb. 21 – March 14, 1999
	Negotiations	May 17, 1999	May 31 – Jun. 01, 1999
	Board	July 8, 1999	
	Plan date of effectiveness	Sept. 1, 1999	

Preparation process was interrupted to allow Government to prepare: (i) a national Rural development Strategy; (ii) an overall strategy for the irrigated sector; (iii) an in-depth study on the ricesubsector; and (iv) a study on the agricultural credit in Mauritania. This has lead to a relative pause in the preparation schedule between Feb. 1996 and Sept. 1998.

**Prepared by:**

- Ministry of Economic Affairs and Development
- Ministry of Rural Development and Environment

**Preparation Assistance:**

PPF: US\$1.300.000  
PHRD: US\$400.000

### People Involved In Project Preparation

<u>Bank Staff</u>	<u>Title</u>
Abdelkrim Oka	Sr. Natural Resources Management Specialist Task Team Leader (AFTR3)
Siaka Bakayoko	Financial Analyst (AFTS2)
Wolfgang Chadab	Disbursement Officer (LOAAF)
Adriana De Leva	Economist (AFTI1)
Francois Gadelle	Irrigation Engineer (AFTR3)
Joselito Gallardo	Financial Specialist (FSD)
Jean Roger Mercier	Sr. Environmental Specialist (AFTE1)
Daniel Moreau	Sr. Agriculturist (AFMCI)
Marie-Jeanne Ndiaye	Team Assistant (AFTR3)
Ismael Ouedraogo	Agricultural Economist (AFTR3)
Ahmedou Ould Hamed	Procurement Officer (AFMMR)
Mohamed Ould Tolba	Agricultural Specialist (AFMMR)
Robert Robelus	Environmental Assessment Specialist (AFTE1)
Lucie Tran	Operations Analyst (AFTR3)
Hans Wabnitz	Counsel (LEGAF)

<u>Consultants</u>	<u>Task</u>
Magaye Gaye	Financial Analysis
Nicolas Gergely	Credit and Rice Subsector
Jean Claude Gouhier	Implementation Manual
Anna Martella	Social Assessment and Impact
Jean-Paul Manshande	Environmental Health
Bachir Ainouche	Rice Processing
Annick Lachance	Monitoring & Evaluation and Logframe
Pierre Ponsy	Water User Associations and Institutions
Dominique Seran	Institution Capacity Building
Jean Michel Voisard	Crops Diversification / Ag. Export Promotion
Emmanuel Holder	Text Processing

<u>Quality Assurance Team</u>	<u>Title</u>
Jean-Paul Chausse	Rural Development, Technical Manager (AFTR3)
Bernard Abeille	Pr. Procurement Specialist (AFTS2)
Carlos Cuevas	Pr. Financial Specialist (AFTP1)
Miguel Saponara	Sr. Economist (AFTM5)
Antoine Simonpietri	Sr. Statistician (AFTI1)
Khalid Siraj	Adviser (FSD)

**DOCUMENTS IN THE PROJECT FILE**  
Mauritania: Integrated Development Project for Irrigated Agriculture

N°	Description	Date	Auteur
1	<i>Étude diagnostic sur le fonctionnement actuel de l'UNCACEM et réflexion stratégique sur la politique de crédit agricole adaptée à la mise en valeur de la vallée du fleuve Sénégal</i>	March 1998	GLG Consultants SOFRECO
2	<i>Politiques et stratégies générales pour le développement du secteur rural. Horizon 2010</i>	March 1998	M.D.R.E.
3	<i>Étude de la filière riz en Mauritanie</i>	March 1998	GLC Consultants SONADER
4	<i>PDI AIM – Composante diversification : Rapport de la mission technique de mise en route de la phase pilote. Filières : melon et papaye</i>	May 1998	Geomar International
5	<i>Etude sur l'entretien des aménagements en Mauritanie : la végétation et le désherbage des réseaux d'irrigation (KIT-SONADER-Banque Mondiale)</i>	June 1998	KIT
6	<i>Étude d'évaluation environnementale du PDI AIM</i>	August 1998	AGRER
7	<i>PDI AIM : Rapport de préparation</i>	September 1998	FAO-CP
8	<i>PDI AIM – Composante diversification : Rapport de la mission de démarrage du programme pilote. Filières : melon et papaye</i>	November 1998	Geomar International
9	<i>PDI AIM : Atténuation de l'impact environnemental. Document de travail</i>	January 1999	Robert Robellus
10	<i>Étude sur le redressement organisationnel et financier d'un périmètre hydro-agricole et désengagement de la SONADER : Leçons tirées de l'expérience de Foum-Gleita</i>	February 1999	SONADER
11	<i>PDI AIM : Rapport technique, composante institutionnelle</i>	February 1999	Dominique Seran
12	<i>PDI AIM : Base de données sur les périmètres irrigués de Mauritanie</i>	February 1999	RIM-SONADER
13	<i>PDI AIM : Note de synthèse portant avis juridique sur les questions foncières</i>	March 1999	I. Ould Abdel Kader

N°	Description	Date	Auteur
14	<i>Schéma de gestion des aménagements structurants : cas de l'aménagement du Gouère et généralisation. Cadre juridique et réglementaire et processus de mise en œuvre</i>	March 1999	Pierre Ponsy
15	<i>Étude diagnostic et évaluation des bureaux d'études mauritaniens</i>	March 1999	ENNAJAH - Consult
16	<i>Synthèse des travaux du groupe interministériel d'experts dans le cadre de la mission de pré-évaluation du PDIAIM</i>	March 1999	RIM-IDA
17	<i>PDIAIM – Composante Diversification : Document technique</i>	March 1999	Jean Michel Voisard
18	<i>PDIAIM : Évaluation des systèmes de gestion financière des agences d'exécution</i>	April 1999	Magaye Gaye
19	<i>PDIAIM : Évaluation de l'impact sanitaire du programme et programmation des mesures d'atténuation</i>	April 1999	Jean-Pierre Manshande
20	<i>Procédures de l'aide incitatrice</i>	May 1999	Nicolas Gergely
21	<i>Évaluation participative de l'impact social du PDIAIM</i>	May 1999	Ana Martella
22	<i>PDIAIM : Tableau des coûts du projet (COSTAB)</i>	June 1999	IDA
23	<i>PDIAIM – Composante Suivi-Évaluation</i>	May 1999	Annick Lachance
24	<i>PDIAIM – Contribution à l'amélioration de la qualité de l'usinage du riz mauritanien</i>	May 1999	Bachir Ainouche

**Status of Bank Group Operations in Mauritania**  
**Operations Portfolio**  
As of 07-Jun-99

Project ID	Fiscal Year	Borrower	Purpose	Original Amount in US\$ Millions				Difference Between expected and actual disbursements a/	
				IBRD	IDA	Cancellations	Undisbursed	Orig	Frm Rev'd
Number of Closed Projects: 33									
<u>Active Projects</u>									
MR-PE-55003	1999	GOV OF MAURITANIE	NUTRITION (LIL)	0.00	4.90	0.00	4.88	0.00	0.00
MR-PE-57875	1999	GOVT OF MAURITANIA	MINING SECT CAPACITY	0.00	15.00	0.00	15.00	0.00	0.00
MR-PE-35689	1998	MINISTRY OF HEALTH & SOCI	HEALTH SECTOR INVEST	0.00	24.00	0.00	22.98	3.72	0.00
MR-PE-1875	1997	GOVERNMENT	RAINFED NAT RES MGT	0.00	18.00	0.00	15.12	1.01	0.00
MR-PE-46650	1997	OMVS	REGIONAL POWER	0.00	11.10	0.00	8.27	5.82	0.00
MR-PE-1874	1996	MINISTRY OF PLAN	PUBLIC RESOURCE MGMT	0.00	21.14	0.00	3.89	2.14	-97
MR-PE-34106	1996	ISL. REP. OF MTA	INFRAST & PILOT DEC.	0.00	14.00	0.00	8.99	9.19	0.00
MR-PE-1857	1995	GOVT OF MAURITANIA	GENERAL EDUCATION PK	0.00	35.00	0.00	17.28	19.07	0.00
MR-PE-38661	1995		FIN/PRIV.SCTR.CAPACI	0.00	7.20	0.00	1.97	2.68	2.68
MR-PE-1864	1994	GOVERNMENT	AGRIC SERVICES	0.00	18.20	0.00	5.82	3.46	0.00
MR-PE-1872	1993	GOVERNMENT	TECHNICAL/VOCATIONAL	0.00	12.50	0.00	6.16	6.29	0.00
Total				0.00	181.04	0.00	110.36	53.38	1.71

	<u>Active Projects</u>	<u>Closed Projects</u>	<u>Total</u>
Total Disbursed (IBRD and IDA):	66.16	497.68	563.84
of which has been repaid:	0.00	163.12	163.12
Total now held by IBRD and IDA:	181.04	321.45	502.49
Amount sold:	0.00	63.35	63.35
Of which repaid:	0.00	63.35	63.35
Total Undisbursed:	110.36	2.74	113.10

a. Intended disbursements to date minus actual disbursements to date as projected at appraisal.

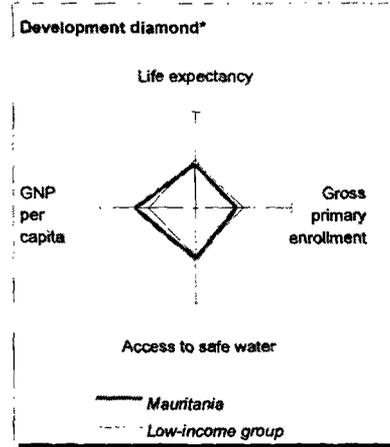
Note:

Disbursement data is updated at the end of the first week of the month and is currently as of 31-May-99.

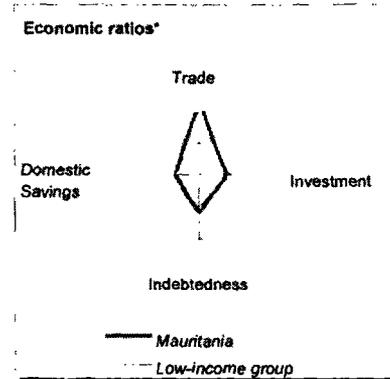
**COUNTRY AT A GLANCE**  
**Mauritania: Integrated Development Project for Irrigated Agriculture**  
**Mauritania**

10/1/98

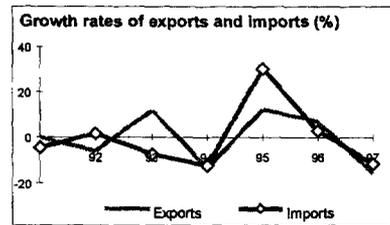
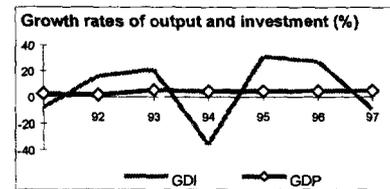
POVERTY and SOCIAL	Sub-Saharan Africa		Low-income
	Mauritania	Africa	
<b>1997</b>			
Population, mid-year (millions)	2.4	614	2,048
GNP per capita (Atlas method, US\$)	450	500	350
GNP (Atlas method, US\$ billions)	1.1	309	722
<b>Average annual growth, 1991-97</b>			
Population (%)	2.5	2.7	2.1
Labor force (%)	2.7	2.6	2.3
<b>Most recent estimate (latest year available, 1991-97)</b>			
Poverty (% of population below national poverty line)	50	..	..
Urban population (% of total population)	54	32	28
Life expectancy at birth (years)	53	52	59
Infant mortality (per 1,000 live births)	92	90	78
Child malnutrition (% of children under 5)	48	..	61
Access to safe water (% of population)	76	44	71
Illiteracy (% of population age 15+)	62	43	47
Gross primary enrollment (% of school-age population)	78	75	91
Male	85	82	100
Female	72	67	81



KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1976	1986	1996	1997	
GDP (US\$ billions)	0.52	0.80	1.1	1.1	
Gross domestic investment/GDP	42.4	30.6	22.1	19.0	
Exports of goods and services/GDP	38.5	56.4	53.6	45.3	
Gross domestic savings/GDP	2.9	7.7	13.9	13.2	
Gross national savings/GDP	20.2	3.2	17.3	15.6	
Current account balance/GDP	..	-27.4	-4.7	-3.4	
Interest payments/GDP	1.5	3.9	2.7	3.0	
Total debt/GDP	77.6	217.8	220.7	216.5	
Total debt service/exports	12.5	20.6	17.7	17.2	
Present value of debt/GDP	..	..	145.1	..	
Present value of debt/exports	..	..	248.0	..	
<b>(average annual growth)</b>					
GDP	1.6	3.3	4.7	5.1	4.6
GNP per capita	-1.1	1.0	1.9	2.9	2.1
Exports of goods and services	7.8	-0.9	7.3	-15.6	0.3



STRUCTURE of the ECONOMY					
	1976	1986	1996	1997	
<b>(% of GDP)</b>					
Agriculture	28.5	26.6	24.8	25.5	
Industry	33.9	31.1	31.6	29.0	
Manufacturing	..	13.1	12.0	9.7	
Services	37.7	42.2	43.6	45.5	
Private consumption	65.2	80.5	72.2	74.6	
General government consumption	31.8	11.8	13.9	12.2	
Imports of goods and services	77.9	79.3	61.8	51.0	
<b>(average annual growth)</b>					
Agriculture	3.2	3.2	3.3	9.6	
Industry	2.6	2.6	2.9	-1.8	
Manufacturing	..	0.1	9.4	-15.3	
Services	-0.1	3.8	7.2	7.5	
Private consumption	3.1	3.3	-3.1	13.4	
General government consumption	-9.9	6.6	3.1	-8.0	
Gross domestic investment	-2.0	0.0	27.5	-9.5	
Imports of goods and services	1.6	-0.9	3.0	-11.4	
Gross national product	1.5	3.6	4.5	5.5	



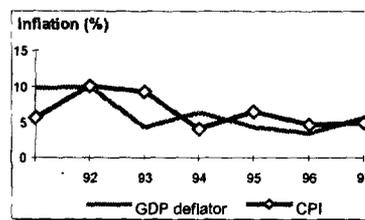
Note: 1997 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

Mauritania

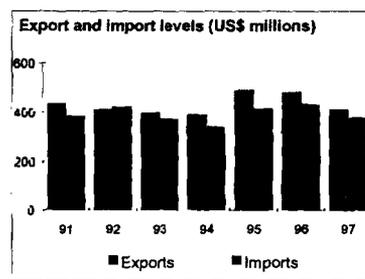
PRICES and GOVERNMENT FINANCE

	1976	1986	1996	1997
<b>Domestic prices</b>				
<i>(% change)</i>				
Consumer prices	..	7.4	4.7	5.0
Implicit GDP deflator	6.0	7.3	3.5	5.7
<b>Government finance</b>				
<i>(% of GDP, includes current grants)</i>				
Current revenue	..	24.8	30.5	26.4
Current budget balance	..	-0.9	12.8	9.6
Overall surplus/deficit	..	-8.3	6.6	4.2



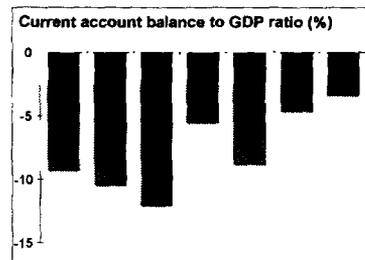
TRADE

	1976	1986	1996	1997
<i>(US\$ millions)</i>				
Total exports (fob)	..	418	485	413
Iron	..	142	207	216
Fish	..	274	277	197
Manufactures	..	..	..	..
Total imports (cif)	..	400	435	380
Food	..	91	97	85
Fuel and energy	..	27	109	95
Capital goods	..	161	85	68
Export price index (1995=100)	..	83	100	101
Import price index (1995=100)	..	83	102	96
Terms of trade (1995=100)	..	100	97	105



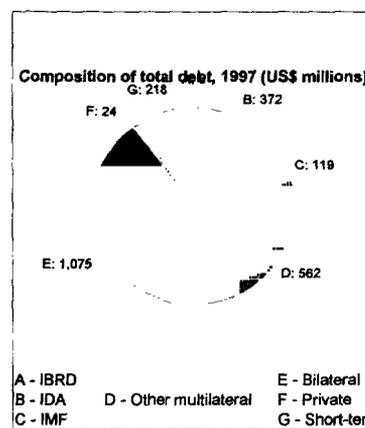
BALANCE of PAYMENTS

	1976	1986	1996	1997
<i>(US\$ millions)</i>				
Exports of goods and services	201	453	586	497
Imports of goods and services	353	637	676	560
Resource balance	-152	-184	-89	-63
Net income	-59	-70	-56	-52
Net current transfers	..	34	94	78
Current account balance	..	-220	-52	-37
Financing items (net)	..	210	101	92
Changes in net reserves	-13	10	-50	-55
<b>Memo:</b>				
Reserves including gold (US\$ millions)	82	53	145	204
Conversion rate (DEC, local/US\$)	45.0	74.4	137.2	151.9



EXTERNAL DEBT and RESOURCE FLOWS

	1976	1986	1996	1997
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	407	1,749	2,415	2,376
IBRD	0	69	8	6
IDA	19	77	359	372
Total debt service	26	94	113	96
IBRD	0	10	3	2
IDA	0	1	4	5
<b>Composition of net resource flows</b>				
Official grants	115	71	176	140
Official creditors	113	130	58	33
Private creditors	53	3	24	-2
Foreign direct investment	2	5	5	3
Portfolio equity	0	0	0	0
<b>World Bank program</b>				
Commitments	3	29	35	29
Disbursements	5	23	36	34
Principal repayments	0	6	4	4
Net flows	5	16	32	30
Interest payments	0	5	3	3
Net transfers	5	11	29	27



ISLAMIC REPUBLIQUE OF MAURITANIA

Honor - Brotherhood - Justice

MINISTRY OF RURAL DEVELOPMENT AND ENVIRONMENT

**Letter of Development Policy for Irrigated Agriculture**

**through 2010**

May 25, 1999

LETTER OF DEVELOPMENT POLICY FOR IRRIGATED AGRICULTURE

**Introduction**

The main objective of the Government is to reduce poverty through accelerated private sector-led development. The Government intends in this way to consolidate and expand the positive results of structural adjustment reforms initiated in 1985. The rural sector is slated to play a fundamental role in reaching this main objective, in two ways: with over 56 percent of the country's employment, about 26 percent of GDP and growth of nearly 10 percent in 1997, the rural sector is expected to serve as the engine growth of Mauritania's development. Because poverty has increased in the rural sector while it has diminished in the country overall from 57 percent to 50 percent between 1990 and 1996, the rural sector must be the focal point of the country's poverty alleviation strategy.

With a territory 80 percent desert and subject to severe and repeated droughts, Mauritania is naturally placing much of its hope in irrigation. The development of irrigated agriculture is therefore a focal point of the Rural Development Strategy through the year 2010 adopted by Mauritania in March 1998 with the support of its development partners. This Letter of Development Policy sets out an operational framework for the irrigated agriculture strategy.

**A. The irrigated agriculture sector in Mauritania**

**1. Irrigated schemes**

Mauritania's irrigable potential was estimated in 1987 at 135,000 ha. Studies now underway point to a need to revise this figure downward. The gross area of irrigated schemes is about 47,000 ha, for a net surface area of 40,000 ha under total water control, but fewer than 20,000 ha are put into production each year. Irrigated schemes are categorized according to their size (small, medium or large) and by the type of management arrangement: collective (or cooperative) schemes and private, individually-managed schemes.

Large collective schemes, ranging in size from 500 to 2,000 ha, and accounting for a total area of 8,461 ha, are equipped with pumping stations or dams that allow for gravity irrigation. These schemes were built with public financing (Government/donors) without beneficiary participation. In general, their construction costs were exceptionally high. With the exception of M'Pourié, they were built by the *Société nationale de développement rural* (SONADER) which, for an annual fee, still handles farmer outreach, operation and maintenance of the collective schemes.

Small and medium-sized collective schemes, ranging from 20 to over 100 ha each, for a total of 10,700 ha, have generally been built by the Government without financial participation from beneficiaries. These schemes are equipped with motorized pumps and are managed by a farmers' group or cooperative. These schemes are old, their infrastructures rudimentary, and the individual plots extremely small – 0.2 to 1.0 ha –, which is often scarcely enough for a family's on-farm consumption.

Private schemes, ranging in size from 10 ha to over 1,000 ha, for a total area of 21,100 ha, were built at the initiative and expense of individual private farmers with no direct State aid. Their infrastructures are generally rudimentary as well, but some have recently been reconstructed in a

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more durable fashion, with new irrigation techniques (sprinklers, drip irrigation, etc.) for purposes of crop diversification.

**2. Potential sources of growth and results to-date**

The potential sources of growth for irrigated agriculture are real and numerous. A potentially strong domestic demand can be expected on the basis of the following factors: rapid population growth (2.5 percent), anticipated income growth (GDP is increasing at 5.6 percent per annum); significant elasticity of demand for the products of irrigated agriculture (rice, fruits and vegetables, fish and fuel wood); and the anticipated control of inflation (target rate of 4.0 percent.) Domestic demand for rice, for example, increased an average of 5.4 percent between 1988 and 1996 – almost as much as urban population growth (5.6 percent) – according to statistics provided by the *Office Nationale de la Statistique*. Rapid sedentarization and urban growth (54 percent of the population now lives in cities) are accompanied by changes in dietary habits in which fruits and vegetables are more emphasized. Domestic consumption of vegetables is estimated to be about 60 kg/head/year in Nouakchott and at 20 kg in rural areas. It is estimated that domestic consumption of fuel wood is eight times higher than the sustainable wood production potential. As for international demand, Mauritania's small share of the European fruit and vegetable market suggests an enormous potential still to be realized.

The Senegal River Valley has the potential to meet these domestic and international demands for high value-added products. The share of domestic rice in total consumption went from 23 percent in the late 1980s to 33 percent over the 1994-97 period. Oilseeds, and especially sunflowers, are another diversification niche according to a study on the scope for developing this crop to meet part of the country's vegetable oil needs. Over the past few years, Mauritania has begun to take advantage of the sustained European demand for fresh vegetables (green beans and okra). Other promising crops include melons and papayas.

The significant progress made in institutional reform in the sector provides support to this growth potential. Initiated in 1988, the agricultural sector structural adjustment program (AGESECAL) clarified the role of Government and implemented key institutional reforms: disengagement of the State and price liberalization; establishment of an agricultural savings and loan entity (UNCACEM); initiation of land tenure reform; reorganization of the Ministry of Rural Development and Environment (MDRE) and restructuring of the *Société nationale de développement rural* (SONADER); definition of the National Agronomic Research Plan (NARP) and of the Agricultural Services Project (ASP); professionalization of responsible agro-pastoral organizations; and, finally, accumulation of knowledge and improved institutional capacity in the area of environmental protection.

Despite the progress made, results are still insufficient, however. Irrigated agricultural schemes are essentially all devoted to rice, and diversification has had trouble making inroads. Despite water control, yields and areas under rice have fluctuated greatly. Declining rice yields have also been observed. Contrary to the expectations of rice projects, double cropping is rare. Domestically-produced rice also fails to meet consumers' quality expectations. Thus, the current profitability of rice is low in Trarza as far as the portion intended for consumption in Nouakchott is concerned, and is only satisfactory in the mid and upper Valley for collective perimeters for rice intended for consumption in this region.

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3. **Constraints and challenges**

Irrigated agriculture faces many constraints which pose challenges for Mauritania. These can be summarized as follows:

**Poor design and rudimentary construction of irrigated schemes.** Except in the large-scale public schemes, the situation of irrigated schemes is one of advanced deterioration and under-utilization of existing infrastructures, for lack of appropriate design and establishment of the schemes. Indeed, most of the private or State-supported small and medium-sized schemes, were poorly designed and carelessly built. Essential items were often omitted, including topographic surveys, soil studies, drainage systems, and proper leveling. SONADER estimated in 1994 that almost all perimeters in production were in need of rehabilitation. The abandonment of schemes due to the absence of drainage infrastructures illustrates the need to build schemes in accordance with construction specifications.

**Poor management and maintenance of schemes and irrigation equipment.** In addition to the inadequate technical design of schemes, there is the lack of management and maintenance of the schemes and equipment since their establishment. On large schemes as well as on collective and individual schemes, maintenance of canals is inadequate. Frequent breakdowns of moto pumps aggravate the situation and contribute to the abandonment of schemes.

**Inadequate financing of irrigated agriculture.** Financing in the rural sector remains insufficient. Until recently, seasonal credit and equipment loans were reserved exclusively for irrigated rice production. Access to this type of credit by small collective producers is still low. As for long-term investment credit, it is entirely non-existent. The lack of long-term investment credit (despite the considerable liquidity of commercial banks) has mainly to do with the difficulty of mobilizing long-term funds on financial markets. However, even if long-term credit were to become available, collective producers would still find access problematic because of their inability to come up with personal equity.

In addition, despite the net improvement in its performance, UNCACEM is faced with an accumulation of bad loans, dating from the first years of its existence, which create an operating deficit. The interest rates it currently charges are not enough to ensure its financial self-sufficiency. Policy discussions have highlighted the value of having an autonomous and specialized credit institution that adheres scrupulously to sound bank management principles.

**Domestic rice support policy, which discourages the production of high-quality rice and crop diversification.** Tariff protection for domestic rice, as well as the generous subsidies granted by the State for its production and marketing, make rice the preferred crop in the Valley. Indeed, counting the value-added tax (VAT) and the so-called *impôt minimum forfaitaire (IMF)*, which do not apply to domestic rice, the overall tax on imported rice is the highest in this part of Africa (48 percent and 53 percent in 1998, depending on the type of rice, and 45 percent in 1999 for all types of rice). The State has also granted significant budgetary subsidies (covering, among other things, interest on 12 months of marketing credit for domestic rice, harvesting and threshing costs, and fertilizer) totaling nearly 500 million UM. Producers thus lack incentives to innovate and try diversification crops. Consumers are therefore penalized in two ways: the tax on

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imported rice and the protection of domestic rice increase consumer prices; and the quality of domestic rice resulting from these measures is often mediocre because producers and processors have no incentive to improve quality.

**Secure land tenure.** Secure tenure, whether of individual or collective lands, is an important factor in encouraging producers to invest in and maintain irrigated schemes, infrastructures and equipment to improve productivity. Current land legislation in principle ensures land tenure security and therefore incorporates incentives for sustainable investment. However, the enforcement of these laws is still hampered by the incompleteness of land transfer procedures, the partial payment of land use fees and the absence of boundary markers. The protection of vital spaces (*espaces vitaux*) and land reserves must also be reinforced. There is also no systematic monitoring of land development, and in particular of the enforcement of Circular No. 008. A pilot operation of irrigated land registry in Trarza Est, under the AGSECAL, pointed up the need to flesh out the legal and institutional framework in order to protect rights and reduce sources of conflict, as well as the importance of information and outreach directed at land users in order to ensure the harmonious and transparent implementation of land tenure reform.

**Low technological level of producers.** Overall, a low level of fertilizer consumption is observed (5,000 tons per year). Manure is for the most part lost to agriculture because of nomadic herding practices and transhumance. Animal traction is still in its infancy in the Valley and is practiced a little in the southeastern part of the country. Rice varieties do not meet consumers' quality expectations. In general, the level of mastery of crop intensification techniques needs much improvement. Fruit and vegetable production and processing techniques that meet export standards remain to be developed for the most part.

**Low level of organization on the part of producers.** In addition to producers' low level of technological know-how, one also observes a low level of managerial capacity among socio-professional organizations. SONADER's abrupt disengagement highlighted the unpreparedness of cooperatives to assume responsibility for managing large irrigated schemes. The drop in yields on these large perimeters can be attributed to a great extent to this sudden withdrawal. The need for an adequate management capacity will be felt even more as producers begin to gain access to long-term credit.

**Inaccessibility and the cost of transport.** The paved road network is still limited. The disastrous condition of such roads as the Rosso-Boghé highway and feeder roads make certain areas with great productive potential inaccessible. In addition to access, however, the availability of transport services, their organization and cost also play an important role in integrating agricultural production into the economy. The creation in 1990 of a road transport depot in Nouakchott for freight and mixed-use transport did not entirely live up to the agricultural sector's hopes: transport charges do not emerge from competition between transporters and among different freight systems, but have instead been fixed thus far by means of negotiations between the Ministry of Equipment and Transport (MET) and the *Fédération Nationale des Transporteurs* (FNT). There was thus no guarantee that an improved road infrastructure would necessarily result in reduced merchandise transport costs. Transport services were also uniform in type, since transporters did not specialize.

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**Environmental degradation due to irrigation.** The degradation of irrigated lands due to waterlogging and salinization presents a challenge that Mauritania must confront immediately. Over the medium and long term, salinization leads to the desertification of irrigated lands. Irrigation also fosters the spread of waterborne diseases (malaria, bilharzia, intestinal parasites, diarrhea diseases, Guinea worm, etc. ), stimulates the growth of opportunistic weeds, and helps pests proliferate (plant-eating insects, rodents and especially grain-eating birds.).

**B. A vision for development in the Valley**

The widely shared vision in Mauritania for the Valley's development consists of the following:

- Efficient and sustainable exploitation of precious land and water resources that are crucial to the country's economic development ;
- Efficient land use based on an economic and institutional environment free of all major distortions, in order to orient private investment towards activities that are most profitable for the country;
- A system of land exploitation whose growth yields broad-based benefits shared by all: for operators, through the profitability of investments; for the agricultural sector, from income and employment creation; and for consumers, in the form of lower prices for staple foods.

This vision is consistent with the overall objectives of Mauritania's Rural Development Strategy through the year 2000, which aims to:

- help ensure food security;
- alleviate poverty and improve rural employment as well as farmers' incomes;
- encourage the integration of agriculture into national and international markets ;
- protect and preserve national resources so as to ensure sustainable development.

For the irrigated sector, the attainment of these overall objectives requires the following interventions, based on the principle of economic return:

- (a) intensification of rice cropping;
- (b) introduction and expansion of crop diversification;
- (c) integration of irrigated crop production with other rural activities;
- (d) export promotion; and
- (e) mitigation of environmental impacts.

These activities are the focus of the Integrated Development Program for Irrigated Agriculture in Mauritania (IDPIAM), which is supported by all donors. This Letter of Development Policy defines the steps that the State intends to take to support these activities.

**C. Operational Plan of Action**

The operational plan of action stemming from the development strategy for irrigated agriculture involves the following areas: adherence to the macro-economic framework; management of water and irrigated land resources; financing of irrigated agriculture; liberalization and promotion

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of product marketing; security of land tenure; capacity building; basic rural infrastructure; and environmental mitigation measures.

**1. Macro-economic framework**

(i) Exchange and interest rates. Changes in rates of foreign exchange, interest and inflation have a profound impact on irrigated agriculture. Thus, depreciation of the Ouguiya causes the price of imported rice to increase and provides additional protection to domestic rice. At the same time, bank interest rates rose considerably in 1998 and 1999, especially vis-à-vis interest rates for agricultural credit. In order to maintain a favorable economic environment, Mauritania will continue its macro-economic policy dialogue with the World Bank and IMF, especially in connection with the 1999-2002 Policy Framework Paper (PFP). The Government will ensure that rural development policy is consistent with this macro-economic policy.

(ii) Agricultural tariffs. Despite the drop in import tariffs as such between 1997 and 1998, the overall tax on imported rice increased over the same period. This was due to local taxes such as the VAT and IMF applied to imported rice but not to domestic rice, and to an increase in the VAT from 5 percent to 14 percent over the same time period. The Government will continue its reform policy of reducing tariffs. Starting in 2002, the same VAT will be imposed upon domestic and imported rice.

**2. Managing water resources and irrigated lands**

(i) Updating of the Master Plan for the right bank. In connection with water management study for the Manantali and Diama dams, OMVS is currently studying the management of the Manantali dam. If the results of this study, which are expected to be available in 1999, are different from those of the baseline study of 1987, the Government will review its priorities regarding the development of irrigated schemes to bring them into line with the available resources, and will update the Master Plan for the right bank. The Master Plan will be updated within two years following the results of the study now underway.

(ii) Priority for the rehabilitation of irrigated schemes. In order to rebuild the irrigated subsector, Mauritania will keep the focus on rehabilitation. The creation of new schemes will only be considered for projects with a very high rate of return (probably for diversification activities). This priority will be the guiding principle behind irrigated scheme development with all Mauritania's development partners and will take effect immediately.

(iii) Better design of irrigated schemes. In order to ensure the physical sustainability of irrigated schemes, the Government will promulgate in 1999, via an Ordinance or Circular, the concept of the development and exploitation of irrigated schemes (as per the revised Circular No. 008) and will see that these technical and environmental standards are applied to any new irrigated scheme design developed with or without a matching grant from the State.

(iv) Operation and maintenance systems. In compliance with the standards set out in the revised Circular No. 008, arrangements for scheme operation and maintenance will need to be specified in any irrigated scheme plan. In the case of large State-financed schemes, operation and maintenance of schemes and equipment will be transferred gradually over the next three years to

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users, who will assume responsibility for these new tasks in the context of regulations concerning users' associations.

(v) the Government will formulate a strategy for the management of water resources for irrigation and will implement cost recovery measures.

**3. Financing irrigated agriculture**

(i) Matching grants for investment in irrigated agriculture. In order to encourage the application of standards to schemes to be rehabilitated or newly created, the Government will establish in 1999 a matching grant mechanism at a level compatible with its means. Matching grants, intended first and foremost to alleviate poverty, will be intended for producer cooperatives (in which each member has less than 2 ha on average), and for individuals with more than 40 ha (counting all schemes).

(ii) Agricultural credit. The Government will continue to assist UNCACEM in diversifying and expanding its activities. It will cease its financial support to UNCACEM if this agency has failed, by the end of FY 2001, to establish an interest rate and funds management policy that ensure its financial self-sufficiency. The Government will also lend no financial support to UNCACEM without having defined repayment terms, which must not be in contradiction with UNCACEM's quest for financial self-sufficiency. In addition, during Phase I of the IDPIAM-IDA, the Government will study the conditions required to create an economic environment conducive to the provision of agricultural credit by commercial banks.

(iii) Agricultural credit guarantees. In order to facilitate this trend and provide guarantees for agricultural credit, the government will study, in the context of judicial reforms, the development of substitute guarantees, e.g., mortgage regulations, collateral, and administration of capital assets. Measures will be developed and implemented over the next two years.

**4. Liberalization and promotion of product marketing**

(i). Liberalization of domestic rice marketing. The domestic rice marketing system, dominated by the *pool*, has revealed its limitations: it benefited mainly large-scale individual producers, since collectives only used it to a limited extent; it did not foster a supply of high-quality rice to consumers; it sapped public finances because of the State subsidies it consumed; and it generated unsustainable losses, even for some members of the *pool*. The domestic rice marketing system will be adjusted and liberalized to provide incentives for producing high-quality domestic rice and to encourage diversification. This liberalization is consistent with the State's disengagement from marketing and from directly production-related activities. Starting with the 1999-2000 cropping season, the Government will:

- (a) eliminate the subsidy on rice marketing credit, as well as direct State subsidization of rice production;
- (b) eliminate the pool system, which links rice imports to paddy purchases;
- (c) eliminate the practice whereby the State determines paddy prices.

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(ii) Measures accompanying the liberalization of domestic rice marketing . In keeping with its role of supporting the private sector, the Government will pursue the accompanying measures, begun during the 1998-99 cropping season, intended to further liberalize domestic rice marketing. Thus, for the upcoming 1999-2000 season, the Government will implement measures to:

(a) Ensure the availability of high quality seed in adequate quantities by: (i) assessing the supply of, and demand for, certified seed of new varieties; (ii) seeking external sources of supply if necessary (Government/UNCACEM financing); (iii) ensuring that CNRADA has access to pre-base seed for off-season and rainy season multiplication; (iv) organizing, with seed propagators, the production of seed for new varieties.

(b) Allow UNCACEM, through the line of credit dispensed by the Government under the IDPIAM, to finance paddy marketing by producer groups and others involved in that production system on the basis of UNCACEM's realistic budget forecasts.

(c) Obtain specialized technical expertise in rice milling in order to: (i) determine, in collaboration with those in the profession, a rice quality standard suited to the country's needs; (ii) train operators in the use of this grid; (iii) establish a program for providing quality testing equipment; (iv) provide technical support to rice millers wishing to improve their units; (v) develop, in collaboration with those in the profession, standard purchase and milling contracts; (vi) assist UNCACEM in defining criteria for evaluating credit requests for equipment and processing.

(d) Provide the seed monitoring and certification service with laboratory equipment to ensure that quality testing services are available during the marketing process at the request of producers and subsector participants .

(e) Establish a system of information on prices and markets for paddy, rice, and agricultural inputs.

(d) Inventory decentralized public and private storage capacities, and draw up a utilization plan in collaboration with the public and private sectors.

(iii) Road transport . To help reduce marketing costs and promote the products of diversification efforts, the Government will, in addition to the preceding measures, enforce the applicable legislation relative to Decree 98/48 and Bylaw R075 concerning liberalization of the transport sector.

(iv) Compliance with patents on botanical materials . Crop diversification, especially for high-value vegetable crops, often relies on the use of patented plant material. In order to facilitate access to botanical products protected by patents, and to safeguard the patent rights on any new varieties that might be developed in Mauritania, Mauritania intends to become a member in 1999 of the Plant Patent Protection Union (*Union pour la protection de l'obtention végétale* - UPOV) .

(v) Regulation and monitoring of plant disease prevention . In connection with the promotion of crop diversification for export, Mauritania will create a plant disease prevention system and will

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establish, under Phase I of the IDPIAM, a mechanism for monitoring crop residues and a set of disease-prevention regulations consistent with international agreements.

**5. Security of land tenure**

(i) Land tenure security . The Government will continue to enforce land laws stipulating – as conditions for obtaining land use permits, temporary concession or permanent concession – the proper development and exploitation of irrigated schemes.

(ii) Equitable distribution . The Government will take steps to ensure the equitable distribution of land.

(ii) Land-use plan . Starting immediately, the Government will require that any future study of a structuring land investment include a land-use plan intended to rationalize land utilization.

**6. Capacity building**

(i) Strengthening socio-professional organizations . The Government will revise the legislation applicable to cooperatives, and expand the legal scope and applicability of texts to all types of association: GIE (*groupements d'intérêt économique*), water users' associations, large scheme users' associations, etc. These measures will be take under Phase I of the IDPIAM.

(ii) Performance contract for SONADER. The Government will revise and adopt SONADER's performance contract so that SONADER can make effective interventions under the IDPIAM. The new performance contract meeting these conditions will be adopted by July 1, 1999.

(iii) MDRE. The Government will improve the capacities of the Ministry of Rural Development and Environment in the areas of programming, monitoring and evaluation, statistics and rural data-gathering.

**7. Basic rural infrastructures**

(i) Rural roads and tracks. A program of construction and rehabilitation of rural roads and tracks is planned under Phase II of the IDPIAM. Prior to its implementation, the Government will develop and enforce, under Phase I of the IDPIAM, a policy concerning the management and maintenance of these infrastructures with the participation of affected communities.

**8. Environmental impact mitigation**

Regarding public investment in collective irrigation infrastructures (dikes, canals, tributaries, drainage channels, etc.), the Government will carry out an environmental impact study and will ensure that the means are available to mitigate the impact of these investments prior to their implementation.

**ENVIRONMENTAL ASSESSMENT AND MANAGEMENT PLAN**  
Mauritania: Integrated Development Project for Irrigated Agriculture

1. The final report for the EA (Environmental Assessment) for this Category A project was completed in August 1998, after comments of the Mauritanian Government were incorporated. The EA is more a Sectoral EA, because the location of most investment projects is not yet known. New investment projects will be all subject to EA. Environmental management capacity to screen, evaluate and implement Environmental Management Plans (EMPs) will be built in phase one. There are no project alternatives in phase one, because most of the PDIAIM in this phase consists of rehabilitation of existing irrigation schemes.
2. The EA consists of four volumes all in French: (1) Executive Summary; (2) Main Text; (3) Annexes; and (4) Public Consultation. The EA provides an extensive discussion on impacts in the Senegal River Valley which have already happened after the closure of the Manantali and Diama Dams and impacts related to irrigation development in Mauritania in the last 30 years. The EA also describes in detail the legal and institutional aspects related to environmental management in Mauritania.
3. The EA report describes the environmental context of the PDIAIM program, which will have a duration of 11 years: (1) Physical Environment and all the environmental problems related to this, such hydrological conditions, soil salinization and alkalinity, the proposed water management of the Manantali dam which would include an annual release of an artificial flood to reduce the environmental and social impacts caused by the closure of the dam and the suppression of the natural annual flood; (2) Biological Environment in the Senegal River Valley, which indicates that most of the original fauna and flora is already gone. It describes also the new pests, such as the *Typha domingensis* invasion caused by maintaining the water level at the same height, and the granivorous birds, which are eating a large part of the rice crop, caused by rice monoculture. It describes also the ongoing desertification in and at the edge of the valley. Health issues, such as malaria, intestinal bilharzia and others health issues, related to changes in hydrological regime, irrigation development and elimination of the salt wedge in the Senegal River are explored in detail. The socio-cultural environment is described in detail. Issues related to the change in land tenure from traditional land tenure to private ownership and the problems related to this are described.
4. The Environmental Impacts are presented in a matrix, indicating a positive or negative impact, importance of the impacts, duration and reversibility and possible mitigation of the impacts. Impacts are analyzed for investment projects on water and soil, biology and ecology, socio-economic impacts, health impacts. Similar types of impacts are analyzed for rehabilitation of irrigation systems. A preliminary analysis is made of future investment projects.
5. The Public Consultation process in the project area with local stakeholders has been described in volume 4 of the final EA report. There will be no resettlement or land acquisition. The project will only support landowners with a land title. The EA report has been available in the World Bank Resident Mission in Nouakchott since November 1998. A Social Assessment is being finalized as part of the EA process.
6. In Mauritania there are extremely few reliable data available. An Environmental Economic Analysis was attempted, but was not feasible, because of lack of even the simplest data. One of the proposed actions in the EMP is the set-up of a network of existing institutions, which would collect data, use them for their own purpose, but also make them available over the network to other users.

**7. The EMP (Environmental Management Plan) consists of 8 different components summarized in table 1 (page 137).**

**8. Monitoring and Evaluation, including M&E of the implementation of the EMP will be done for the entire PDIAIM by the PDIAIM Coordination unit. The Mauritanian environmental and irrigation authorities will be entirely involved in this activity.**

**Table 1: Components of the EMP of the PDIAIM-IDA**

EMP of the PDIAIM-IDA	Year 1	Year 2	Year 3
Environmental Management Capacity Building	Training of 25 experts from government agencies, private consultants, universities and NGOs		
Environmental Information System			
Environmental Databases and a GIS network	Priority data collection	TOR for Database development/ installation of databases	Establish databases and TOR and Feasibility study for GIS
Modeling of water consumption on irrigation system level			Prepare TOR / Implement study
Water Supply for local groups. Construction to be executed through NGOs	Wells no: 15	Wells no: 25	Wells no: 35 Borcholes No: 3
Participatory Land Use Plans (POSs)	Feasibility Study for a Pilot	Execution of Land Use Plan	Execution of Land Use Plan, M&E
Elaboration Environmental Norms and Manuals	Establish TORs, prepare new manuals and apply them in sub-projects	Apply Manuals	Apply Manuals
Environmental Fund for Micro-projects to mitigate existing impacts from former irrigation development and mitigate impacts from new projects	Establish a Management Unit for the fund and elaborate a Manual of Procedures	Identification of Micro-projects on a demand driven basis. Preparation of Micro-projects in a participatory manner	Identification of Micro-projects on a demand driven basis. Preparation of Micro-projects in a participatory manner
Public Health mitigation plan to mitigate health impacts from changes in hydrology and irrigation development, which will be financed through the existing IDA financed health sector project	Identification of Public Health activities together with the Ministry of Health	Execution of public health activities to avoid and mitigate the impacts of water borne diseases	Execution of public health activities to avoid and mitigate the impacts of water borne diseases



MAP SECTION







MAURITANIA

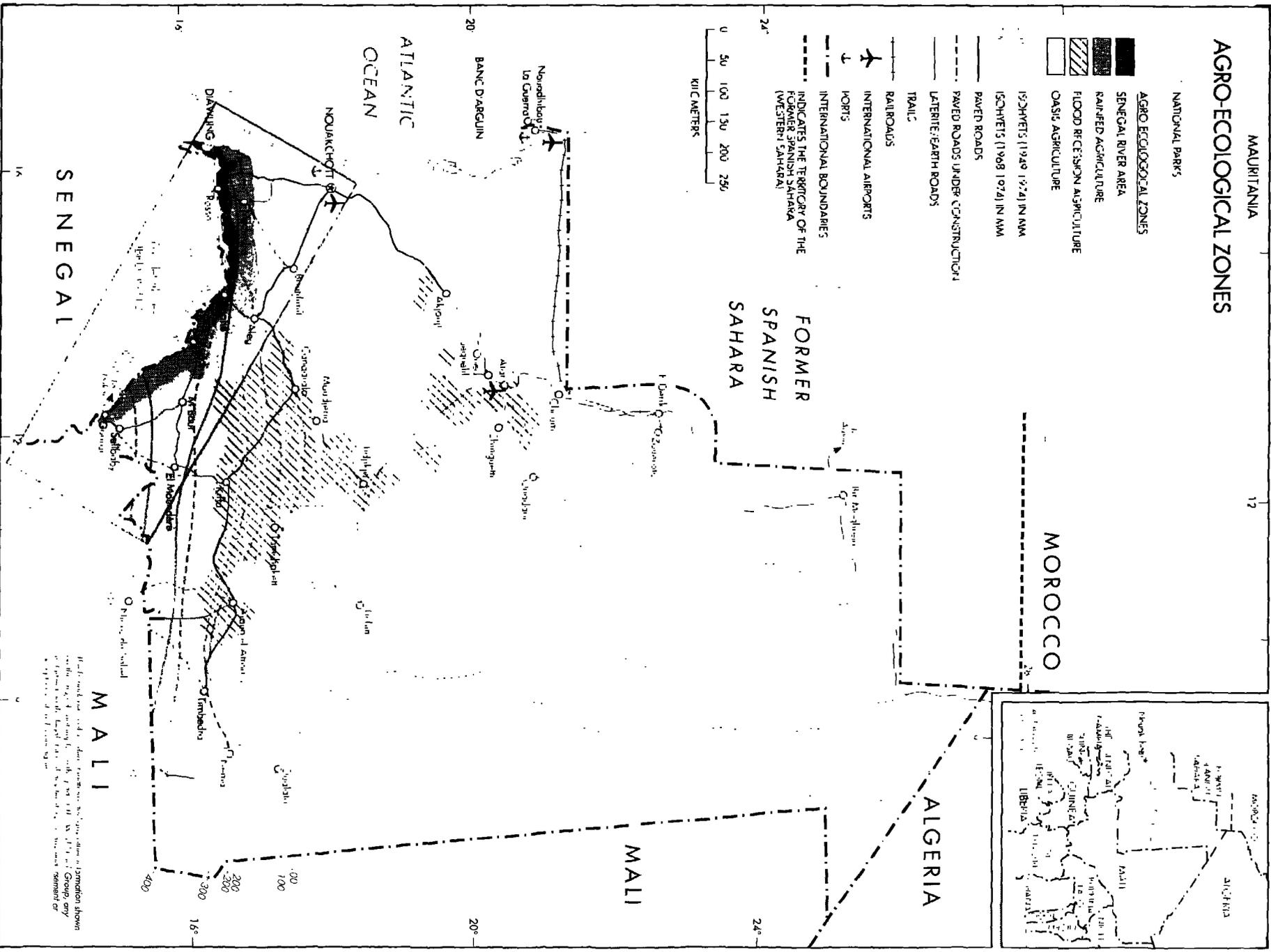
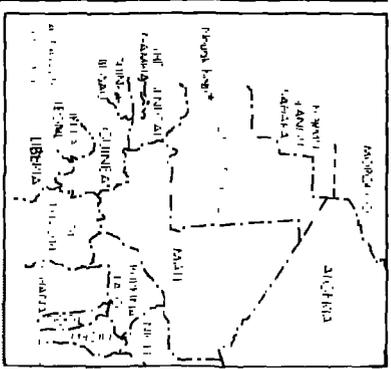
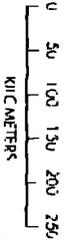
12

# AGRO-ECOLOGICAL ZONES

- NATIONAL PARKS
- AGRO-ECOLOGICAL ZONES
  - SENEGAL RIVER AREA
  - RAINFED AGRICULTURE
  - FLOOD RECESSION AGRICULTURE
  - OASIS AGRICULTURE

ISCHYETS (1949 1974) IN MM  
 ISCHYETS (1968 1974) IN MM

- PAVED ROADS
- PAVED ROADS UNDER CONSTRUCTION
- LATERITE/EARTH ROADS
- TRAILS
- RAILROADS
- INTERNATIONAL AIRPORTS
- PORTS
- INTERNATIONAL BOUNDARIES
- INDICATES THE TERRITORY OF THE FORMER SPANISH SAHARA (WESTERN SAHARA)



If a road has a solid line, it is paved. If a road has a dashed line, it is paved under construction. If a road has a dotted line, it is a laterite/earth road. If a road has a solid line with a dashed border, it is a trail. If a road has a solid line with a hatched border, it is a railway. If a road has a solid line with a solid border, it is an international airport. If a road has a solid line with a solid border and a flag, it is a port.