

**AFRICAN DEVELOPMENT FUND**

**NIGER**

**TAHOUA REGION WATER HARNESSING PROJECT  
(PMET)**

SAP No.: P-NE-AAC-002  
Loan No. 2100150000756

**PROJECT COMPLETION REPORT**

## TABLE OF CONTENTS

	<u>Page</u>
<i>Acronyms and Abbreviations, Exchange Rate, Basic Data, Logical Framework</i> _____	<b>i-vi</b>
<b>EXECUTIVE SUMMARY</b> _____	<b>vii-ix</b>
<b>1. INTRODUCTION</b> _____	<b>1</b>
<b>2. PROJECT OBJECTIVES AND FORMULATION</b> _____	<b>1</b>
2.1 PROJECT OBJECTIVES _____	1
2.2 PROJECT DESCRIPTION _____	1
2.3 PROJECT ORIGIN AND FORMULATION _____	2
<b>3. PROJECT IMPLEMENTATION</b> _____	<b>3</b>
3.1 LOAN EFFECTIVENESS AND PROJECT START-UP _____	3
3.2 MODIFICATIONS _____	3
3.3 IMPLEMENTATION SCHEDULE _____	4
3.4 REPORTING _____	4
3.5 PROCUREMENT _____	4
3.6 PROJECT COST, SOURCES OF FINANCE AND DISBURSEMENTS _____	5
<b>4. PROJECT OUTCOMES AND PERFORMANCE</b> _____	<b>5</b>
4.1 OUTCOMES BY COMPONENT _____	5
4.2 INSTITUTIONAL PERFORMANCE _____	11
4.3 PERFORMANCE OF CONSULTANTS, CONTRACTORS AND SUPPLIERS _____	12
4.4 FINANCIAL PERFORMANCE _____	12
4.5 ECONOMIC PERFORMANCE _____	13
<b>5. PROJECT SOCIAL AND ENVIRONMENTAL IMPACT</b> _____	<b>13</b>
5.1 SOCIAL IMPACT _____	13
5.2 ENVIRONMENTAL IIMPACT _____	14
<b>6. PROJECT VIABILITY</b> _____	<b>14</b>
<b>7. PERFORMANCE OF THE BANK ,THE BORROWER AND WFP</b> _____	<b>15</b>
7.1 PERFORMANCE OF THE BANK _____	15
7.2 PERFORMANCE OF THE BORROWER _____	15
7.3 PERFORMANCE OF WFP _____	15
<b>8. OVERALL PERFORMANCE AND RATING</b> _____	<b>16</b>
<b>9. CONCLUSIONS, LESSONS LEARNT AND RECOMMENDATIONS</b> _____	<b>16</b>
9.1 CONCLUSIONS _____	16
9.2 LESSONS LEARNT _____	16
9.3 RECOMMENDATIONS _____	18

### LIST OF ANNEXES

<i>Annex 1</i>	<i>Project Location Map</i>
<i>Annex 2</i>	<i>Summary Table of Project Outcomes</i>
<i>Annex 3</i>	<i>Project Disbursements</i>
<i>Annex 4</i>	<i>Evaluation of Economic Rate of Return (ERR)</i>
<i>Annex 5</i>	<i>List of Major Contracts Awarded under the Project</i>
<i>Annex 6</i>	<i>Performance Assessment and Rating</i>
<i>Annex 7</i>	<i>Matrix of Recommendations and Follow-up Measures</i>
<i>Annex 8</i>	<i>Sources of Information</i>

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## ACRONYMS AND ABBREVIATIONS

ABC-Ecologie	:	Association for Community Welfare and Ecology (NGO)
ADB	:	African Development Bank
ADF	:	African Development Fund
BCEAO	:	Central Bank of West African States
BD	:	Bidding Documents
BEEEI	:	Environmental and Impact Assessment Agency
CNCR	:	National Rural Code Committee
COFO	:	Land Commission
COFOB	:	Local Land Commission
DAERA	:	Department of Rural Agriculture Development and Equipment
DEP	:	Department of Research and Planning
DFS	:	Decentralized Financial System
DWS	:	Drinking Water Supply
EIG	:	Economic Interest Group
ERR	:	Economic Rate of Return
ESMP	:	Environmental and Social Management Plan
IHC	:	Integrated Health Centre
INRAN	:	Niger National Institute Agricultural Research
LGS	:	List of Goods and Services
MDA	:	Ministry of Agricultural Development
MEF	:	Ministry of Economy and Finance
MFI	:	Micro-Finance Institution
NGO	:	Non-Governmental Organization
PADAZ	:	Zinder Region Agricultural Development Project
PADL-Diffa	:	Diffa Region Local Development Support Project
PCR	:	Project Completion Report
PED	:	Preliminary Engineering Design
PIP2	:	Private Irrigation Promotion Project – Phase II
PMET	:	Tahoua Region Water Harnessing Project
PMU	:	Project Management Unit
PO	:	Producer Organization
PRS	:	Poverty Reduction Strategy
PVDT	:	Dosso and Tillaberi Regions Water Resource Development Project
RBCSP	:	Results-Based Country Strategy Paper
RDS	:	Rural Development Strategy
SC	:	Steering Committee
SICR	:	Rural Credit Intermediation Service (Kokari)
SP/CR	:	Permanent Secretariat of the Rural Code
SWC/SPR	:	Soil and Water Conservation/Soil Protection and Restoration
SYSCOA	:	West African Accounting System
UA	:	Unit of Account
WFP	:	World Food Programme

## CURRENCIES AND MEASURES

Currency Unit: CFA

		At Appraisal (March 1998)	On Completion (June 2007)
UA	1	820.791	737.656

## ANNUAL AVERAGE EXCHANGE RATE TREND

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CFAF/UA	787	889.8	968	933.4	874.9	798.4	757.8	793.8	749.3	706.6
	100%	113%	123%	119%	111%	101%	96%	101%	95%	90%

- These exchange rates represent the annual averages for the period indicated.

### **BASIC PROJÉT DATA**

1. Country : Niger
2. Project : TAHOUA REGION WATER HARNESSING PROJECT
3. Project No. : P-NE-AAC-002
4. Loan No. : 2100150000756
5. Borrower : Government of Niger
6. Beneficiaries : Inhabitants of Tahoua region
7. Executing Agency : Management Unit, Rural Engineering Department, Ministry of Agriculture

#### **A. LOAN**

- |    |                    |            |
|----|--------------------|------------|
| 1. | Amount (in UA)     | 7.950.000  |
| 2. | Service Charge (%) | 0.75       |
| 3. | Commitment Fee (%) | 0.50       |
| 4. | Repayment Period   | 50 years   |
| 5. | Grace Period       | 10 years   |
| 6. | Approval Date      | 15/07/1998 |
| 7. | Signature Date     | 12/11/1998 |
| 8. | Effectiveness Date | 07/04/1999 |

#### **B. PROJECT DATA**

1. Total Cost and Financing Plan (in million UA)

	Sources	At Appraisal			On Completion
		F.E.	L.C.	Tot.	Total
	ADF	5.89	2.06	7.95	7.95
	GOVERNMENT	0.00	0.80	0.80	0.84
	BENEFICIARIES	0.00	0.22	0.22	0.59
	WFP	-	-	-	1.04
	<b>TOTAL</b>	<b>5.89</b>	<b>3.08</b>	<b>8.97</b>	<b>10.42</b>

- |   |            |
|---|------------|
| 2. Effective date of first ADF disbursement             | 30/03/2001 |
| 3. Effective date of last disbursement                  | 09/08/2007 |
| 4. Start-up date of project implementation activities   | March 2001 |
| 5. Completion date of project implementation activities | 30/06/2007 |

#### **C. PERFORMANCE INDICATORS**

- |  |   |                                    |
|--|---|------------------------------------|
| 1. Cancellation (in UA million)                      | : | 0.00                               |
| 2. Time Underrun/Overrun                             |   |                                    |
| - Slippage on effectiveness                          | : | - 1 month                          |
| - Slippage on completion date                        | : | + 2.5 years                        |
| - Slippage on last disbursement                      | : | + 26 months                        |
| - Number of extensions of the last disbursement date | : | 2                                  |
| 3. Project implementation status                     | : | Completed                          |
| 4. List of verifiable indicators                     | : | cf. Annex 2                        |
| 5. Institutional performance                         | : | satisfactory                       |
| - Bank   | : | satisfactory                       |
| - Gov.   | : | satisfactory                       |
| 6. Performance of Consultants                        | : | satisfactory                       |
| 7. Performance of Contractors                        | : | average (delays)                   |
| 8. Economic Rate of Return (ERR)                     | : | 20% (appraisal) 13.1% (completion) |

**D. MISSIONS**

Date	Mission	No. of Pers.	Composition	H/j
	Identification			
	Preparation			
	Appraisal			
2-20 Aug. 1999	Launching	2	Rural Engineer + Agronomist	38
25 June – 16 July 2001	Supervision	2	Agronomist TM + Livestock Expert	46
21-30 December 2001	Supervision	1	Environmentalist	10
15-25 October 2002	Supervision	1	Agronomist	11
29 Sep. – 14 Oct. 2003	Supervision	1	Agronomist	16
17-25 November 2004	Supervision	1	Agronomist	9
9-10 April 2005	Supervision	1	Livestock Expert	2
17-19 June 2005	Supervision	1	Disbursement Officer	3
24-25 September 2005	Supervision	1	Rural Engineer	2
23 May – 06 June 2006	Supervision*	1	Disbursement Officer	2
19 Sep. – 3 Oct. 2006	Supervision*	2	Rural Engineer + Credit Specialist	8
24 Apr – 12 Mar 2007	Supervision*	1	Rural Engineer	2
3 – 18 March 2008	Completion	2	Rural Engineer + Agronomist	32

\*: ADB supervision mission involving several rural sector projects, including PMET

**E. ADF LOAN DISBURSEMENTS (UA)**

	Estimate at Appraisal	Actual Amounts	Percentage (%)
- <u>Total Disbursed</u>	7 950 000	7 950 000	100
- <u>Amount Cancelled</u>	0	0	-
- <u>Annual Disbursements</u>			

Year	Estimated	Completed	Disbursed %	Total Disbursed %
1999	1 200 000	0	0%	0%
2000	2 900 000	0	0%	0%
2001	3 010 000	410 000	5.2%	5.2%
2002	360 000	910 000	11.4%	16.6%
2003	440 000	2 470 000	31.1%	47.7%
2004		1 510 000	19.0%	66.7%
2005		1 670 000	21.0%	87.7%
2006		730 000	9.2%	96.9%
2007		250 000	3.1%	100.0%
TOTAL	7 950 000	7 950 000	100%	

## FINAL LOGICAL FRAMEWORK

HIERARCHY OF OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS		MEANS OF VERIFICATION	ASSUMPTIONS/RISKS	
	AT APPRAISAL	ON COMPLETION		AT APPRAISAL	ON COMPLETION
<u>SECTOR GOAL</u> Contribute to poverty reduction through improved food security and living conditions in the Tahoua Department	1. Improved food production  2. Improved incomes	1. The Project contributed to improved food production  2. The incomes of the Project's beneficiaries increased	1. Status and supervision reports  2. Departmental statistics  3. Reports of departmental and administrative services		
<u>PROJECT OBJECTIVES</u>  1. Increase agricultural and animal production	1.1 -8.290 tonnes of millet and sorghum, 1740 tonnes of cowpeas, 5365 tonnes of vegetables and 150 tonnes of cotton products. - 2 450 cattle, 21 660 sheep and 17 260 goats (additional)  1.2 1 539 farmers organized and settled  1.3 Promotion of rural activities	1.1 -7.200 tonnes of millet/sorghum yearly following SWC/SPR; 8.600 tonnes of vegetables;  - Non-estimated increase in animal production  1.2 14 286 smallholdings covered including 2 017 farmers organized into POs  1.3 The project set up: 217 POs, 6 PO Unions, 7 Cooperatives, 16 Management Committees, or a total of 246 producer organizations	<ul style="list-style-type: none"> <li>• Report of technical services</li> <li>• Departmental statistics</li> <li>• Periodical project reports</li> <li>• Monitoring-evaluation reports</li> <li>• Completion report</li> <li>• Reports of departmental administrative services</li> </ul>	<ul style="list-style-type: none"> <li>• Normal climate and rainfall</li> <li>• Harmonious management of rural areas</li> <li>• Technical themes adopted by producers</li> </ul>	
OUTPUTS					
1. Construction and management of 5 hydraulic structures (dams and weir)	1.1 Four water harnessing structures built at Kounkouzout, Gounfara, Adouna and Karaji, allowing the development of 720 ha flood recession cropping areas  1.2 Kounkouzout structure developed for gravity irrigation, over 90 ha, flood recession cropping, over 70 ha  1.3 Fifth dam with capacity of 830.000 m3 built at Anekar for stock watering  1.4 Erosion control works to protect structures through the planting of trees on 80 ha  1.5 7 km of bank protection works carried out at Kounkouzout and Anekar	1.1 Eight structures built including at Karadji Nord, Lilango, Alibou, Minao, Bagaye-Kounkouzout, and Adouna in Tahoua Department and two weirs at Gounfara, in Konni Department.  1.2 Gravity irrigation option dropped. Kounkouzout dam replaced by 3 flood diversion weirs (Kounkouzout, Alibou and Minao)  1.3 Abandonment of the Anekar dam, which became too costly following the expansion of the <i>kori</i> . To compensate, cemented pastoral wells built  1.4 A 10 ha-plantation developed along 11 km around the Adouna water retention structure. Use of mainly hard protective materials  1.5 1735 ml of longitudinal gabion protection, 2 gabion weirs, 1 cyclopean concrete weir and 4 gabion evacuation dykes enabled the protection of 11.5 km of <i>kori</i> banks;	<ul style="list-style-type: none"> <li>• Completion reports and reports of operation of structures</li> <li>• Progress, supervision and completion reports</li> <li>• Mid-term review report</li> <li>• Final evaluation report</li> <li>• Country and Bank completion reports</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of structures remains reasonable</li> </ul>	

HIERARCHY OF OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS		MEANS OF VERIFICATION	ASSUMPTIONS/RISKS	
	AT APPRAISAL	ON COMPLETION		AT APPRAISAL	ON COMPLETION
2. Implementation of SWC/SPR works	SWCSPR works undertaken, allowing the reclamation and protection of the 2.425 ha distributed/	8,871 ha developed and protected with the support of WFP, which provided food supplies			
3. Improvement of cropping and stockbreeding practices	Three-year research and development agreement signed with INRAN	Agreement signed with INRAN allowing implementation of R&D programme for the benefit of beneficiaries	<ul style="list-style-type: none"> <li>Signed agreement and INRAN activity reports</li> </ul>		
4. Supervision, training and equipping of farmers, stockbreeders and women	Technical supervision put in place, allowing participatory training for 1,539 farmers	<p>The Project established: 217 POs, 6 PO Unions, 7 market gardeners cooperatives, 16 input shops, or a total of 246 bodies</p> <p>169 contact groups trained under extension programme</p> <p>About 20 groups engaged in seed production</p> <p>2,506 listeners registered for literacy classes of whom 657 declared literate;</p> <p>Staff of technical departments and of ABC - Ecologie NGO trained</p>	<ul style="list-style-type: none"> <li>Status, supervision and completion reports</li> </ul>		
5 Setting up of guarantee fund	Guarantee fund of CFAF 150 million deposited at local banks to provide credit to rural organizations for the financing of short- or medium-term activities	Guarantee fund of CFAF 180 million deposited at SONIBANK. Loans amounting to a total of CFAF 953 893 725 distributed by KOKARI to project beneficiaries, who have repaid up to 97%.	<ul style="list-style-type: none"> <li>Status, supervision and completion reports</li> </ul>		<p>KOKARI and other community-based financial services continue to provide loans</p> <p>A disaster fund is set up over time</p>
6. Land development	720 ha of flood recession crops 11.490 ha of intense rain-fed crops cultivated yearly under the Project	998 ha of flood diversion or flood recession land are available and 8.871 ha of land have been reclaimed through half-moon works and stone-piling. Technical supervision is provided for the other irrigated areas (an estimated 8.000 ha)	<ul style="list-style-type: none"> <li>Status, supervision and completion reports</li> </ul>		The Government has organized minimum technical supervision for Project beneficiaries
7. Establishment of socio-economic and rural infrastructure	<p>7.1 41 km of tracks rehabilitated</p> <p>7.2 15 community stores built</p> <p>7.3 Five wells equipped with mechanical pumps, 10 wells with manual pumps and 45 village and pastoral wells built by Project, and management teams for these facilities trained</p> <p>7.4 Concrete measures implemented in favour of women in the area of health, organization and</p>	<p>7.1 Three tracks totalling 37.2 km rehabilitated and access to 8 villages improved</p> <p>7.2 14 community stores built in semi-hard material and old store rehabilitated. These 15 units used as input shops</p> <p>7.3 84 cemented and equipped shallow wells sank, 61 of which were positive, and 2 mini-DWS units constructed at Bagaye and Gounfara. The management committees for the two mini-DWS units are operational</p> <p>7.4 Ten health huts planned built, equipped</p>	<ul style="list-style-type: none"> <li>Status, supervision and completion reports</li> </ul>		Management committees are supervised, receive training and remain competent

HIERARCHY OF OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS		MEANS OF VERIFICATION	ASSUMPTIONS/RISKS	
	AT APPRAISAL	ON COMPLETION		AT APPRAISAL	ON COMPLETION
	credit	and stocked with initial supply of consumables and medicines. Bagaye and Adouna IHC also equipped by Project.			
8. Other support measures	<p>8.1 Two land commissions set up in Tahoua and Birni Konni Departments</p> <p>8.2 Agreement signed with Environmental and Impact Assessment Agency (BEEEL) to ensure proper environmental monitoring of Project activities</p>	<p>8.1 Two land commissions set up, and equipped with one vehicle each. Assisted with creation of 142 local land commissions (COFOB) including 48 in Project area</p> <p>8.2 Project environmental impact assessment produced in 2003, followed by ESMP, to be implemented and monitored by BEEEL. Training sessions organized at technical level as well as among population</p>	<ul style="list-style-type: none"> <li>Status, supervision and completion reports</li> </ul>		
9 Setting up of Project Implementation Unit	<p>9.1 PMU comprising Director, 5 local management staff and technical assistance staff set up</p> <p>9.2 Office building constructed and equipment procured in Tahoua for PMU</p>	<p>9.1 Management unit established in accordance with planned arrangements</p> <p>9.2 Project offices built and equipped in Tahoua.</p>			
<u>KEY ACTIVITIES</u> 1. DEVELOPMENT 2. IMPLEMENTATION 3. SUPPORT MEASURES 4. PROJECT UNIT	<u>RESOURCES</u> ADF: UA 7.95 million Government: UA 0.80 million Beneficiaries: UA 0.22 million  Total: UA 8.97 million	<u>RESOURCES</u> ADF: UA 7.95 million Government: UA 0.84 million Beneficiaries: UA 0.59 million WFP : UA 1.04 million  Total : UA 10.42 million	ADF/Gov loan agreement signed  Project completion report  ADF supervision	Timely signing of loan agreement  Active participation of beneficiaries	Active ADB-NIGER cooperation  Contribution of beneficiaries assessed in terms of labour provided: 886.000 workdays (500 F/day from ADF and 250F/day from beneficiaries)



## **EXECUTIVE SUMMARY**

### **1. INTRODUCTION**

To address the issue of unstable weather conditions and other serious threats to food security, the Niger Government has placed the harnessing of water resources at the heart of actions to promote poverty reduction. The Tahoua Region Water Harnessing Project (PMET), identified in 1990, was one of the first attempts by the Government directed at implementing this policy. The Project was prepared with the support of the Bank, which financed the run-off water harnessing study in the three regions of Niger worst hit by drought: Tahoua, Zinder and Agadez. The population was closely involved right from the preparatory phase of the Project whose design was based on the construction of easy-to-manage erosion control protective and small hydraulic structures (dams and weirs). The five-year PMET was aimed ultimately at the management and development of 720 ha of irrigated farming and 11.490 ha of rain-fed agriculture, and increased livestock production. The ADF loan, amounting to UA 7.95 million, was approved on 15 July 1998 and became effective on 7 April 1999. However, field implementation could not effectively take off until March 2001, owing to the suspension of disbursements imposed on Niger from August 1999 until February 2001.

### **2. PROJECT OBJECTIVES**

The PMET's sector goal was to contribute to poverty reduction by improving food security and living conditions in the Tahoua Region. The specific objective of the Project was to increase agricultural and livestock production. It was intended to contribute to the conservation and restoration of the environment, and help improve living conditions in the project area.

### **3. PROJECT PERFORMANCE**

Apart from the delay resulting from the suspension of disbursements imposed on Niger, the Project was implemented under highly satisfactory conditions thanks to the outstanding mobilization of government services, the beneficiaries and the Bank, coordinated and led by a dynamic and competent Project Unit. In its area of intervention, PMET has made significant strides towards achieving its objective of poverty reduction and improving the living conditions of the population, particularly improved food security for a population of over 100,000 habitants. The key expected physical outputs of the Project have been achieved and even largely exceeded with an overall highly satisfactory quality and encouraging prospects for sustainability. In addition to the capacity building of the beneficiary population and support to local development, the Project outputs and activities have laid the groundwork for sustainable development and helped to meet priority needs. This overall good performance translates into a ranking of 3.6 out of 4 on completion.

### **4. LESSONS LEANT AND RECOMMENDATIONS**

#### **4.1 Lessons Learnt**

The PMET's success lies in a number of pillars, including mainly: the implementation of simple technical solutions to essential problems, the systematic application of a participatory approach and the development of partnerships, the involvement and

empowerment all stakeholders, the high calibre and professionalism of the Project Management Unit staff, the time invested in developing the facilities and support provided the producers as well as the good responsiveness of the Bank. The excellent implementation of the credit component (97% recovery) constitutes an exceptional success, in the general context of the usual known difficulties involved in access to and recovery of credit in rural areas. The putting in place of an effective intermediation service close to the producers contributed to a large extent to the results obtained. The poor organizational and financial capacity of local and national public works enterprises constitutes an impediment to the proper development of the irrigation sub-sector. It is essential for the Government and development partners to consider building the capacity of the enterprises and facilitating access to equipment credit. To ensure the sustainability of the PMET's gains, it is also imperative for the government decentralized technical departments to continue monitoring activities in the field while capitalizing on the results obtained.

#### 4.2 Recommendations

In view of the results and lessons observed upon completion of the PMET, the following is recommended:

- The Bank:
  - i) ensure, through all available channels of communication, extensive dissemination of the good outcomes of the PMET.
  - ii) support the Government of Niger to capitalize and build on the successes achieved through the Project's interventions, in order to ultimately promote a real national strategy in the harnessing of water resources.
  - iii) take into account the successful PMET experience in rural credit, and compare it to other credit financing mechanisms supported by the Bank, in order to determine the extent and manner in which this experience could be customized, developed and reproduced.
  - iv) consider the potential of the Tahoua region and the needs expressed for the harnessing of water resources and for improved access to remote areas, and envisage a study for a second phase that is based on the lessons and achievements of the PMET.
  - v) examine, within the framework of its cooperation with the Republic of Niger, the ways and means of contributing to strengthening and equipping small and medium-scale enterprises involved in irrigation works.
- The Borrower:
  - i) make all the necessary arrangements to settle, as soon as possible and no later than 31 December 2008 the unpaid balance on four contracts still owed some national enterprises, amounting to a total of CFAF 57,047,513.

- ii) continue to ensure in the field, through the relevant technical departments, the follow-up of the PMET's activities and support to producers, so as to maintain the momentum set in motion and boost the sustainability of the various actions initiated by PMET.
- iii) take the necessary measures at the different sites to ensure a simple hydrometric monitoring of the water flow, water surface and groundwater of the harnessing structures built.
- iv) promote in areas with water bodies the production of agro-forestry plants, to be procured by projects or NGOs, for the indispensable reforestation of denuded catchment areas, as part of combating desertification.
- v) ensure at the regional and national levels, the extensive dissemination of the PMET's results while developing the capitalization of the PMET's experience in water harnessing, in coordination with the other Bank-financed rural development projects (PADAZ, PADL Diffa and PVDT).
- vi) make every effort to maintain the sustainability of the PMET credit component, through the implementation and close monitoring of the memoranda of understanding signed with SONIBANK and KOKARI.
- vii) promote the development and capacity-building of national enterprises specialized in irrigation schemes, in liaison with development partners, through training activities and easier access to equipment credit.

## **1. INTRODUCTION**

1.1 Niger's natural resources, as is the case with other Sahel countries, have in recent decades been subjected to the harmful effects of persistent drought and substantial population pressure. The country's cereal balance, which was positive until the early 1970s, became negative from the end of the 1980's. With regard to animal resources, successive droughts and the deterioration of grazing grounds and production systems have taken a heavy toll on performance. Concerning the environment, the situation is marked by declining plant life and overexploitation of forests. The water resource potential is considerable, but the harnessing and exploitation of this resource remains limited. In a bid to address the problem of unstable weather conditions and other serious threats to food security, the Niger Government has placed the harnessing of water resources at the heart of actions to promote poverty reduction. The Tahoua Region Water Harnessing Project (PMET), identified in 1990, was one of the first attempts by the Government directed at implementing this policy.

1.2 At appraisal in 1998, the sector goal of the Project was in keeping with the Bank's strategy and with that of the Government, for whom the agro-silvo-pastoral sector was vital to Niger's economic and social development. The objectives set out then are still relevant to the national and sector strategies adopted when the loan agreement was signed, as evidenced in the Poverty Reduction Strategy (PRS, 2002) and the Rural Development Strategy (RDS, 2003). In the last decade, the Bank has paid special attention to the rural sector, through environmental protection and surface water harnessing projects. As at March 2008, the Bank's portfolio in Niger contained 15 operations, including 3 in the rural sector, which account for 27.2% of the total financing for the active portfolio. These actions, focused on rural development and the strengthening of infrastructure, are in keeping with its poverty reduction intervention strategy and consistent with the national poverty reduction and rural development policies and strategies.

1.3 This completion report was prepared nine months after the closing of the Project, and is based on the Bank's supervision reports, documentation provided by PMET and, in particular, the Project mid-term review and final evaluation reports, as well as information gathered from government representatives, partners and project beneficiaries, during the field mission to Niger from 2 to 18 March 2008.

## **2. PROJECT OBJECTIVES AND FORMULATION**

### **2.1 Project Objectives**

The PMET's sector goal was to contribute to poverty reduction by improving food security and living conditions in the Tahoua Region. The specific objective of the Project was to increase agricultural and livestock production. It was intended to contribute to the preservation and restoration of the environment, and help improve living conditions in the project area.

### **2.2 Project Description**

2.2.1 The five-year PMET was intended to put up hydraulic structures (small dams or weirs), for the development and improvement of 720 ha of irrigated crops and 11,490 ha of rain-fed crops, as well as the development of animal production including an increase in livestock numbers (2,450 cattle and 39,000 of sheep and goats). Originally, five sites in

Tahoua Department (now a region) were identified, following a preparatory study conducted in 1992 and financed by the Bank's Technical Assistance Fund. Four sites were located respectively at Kounkouzout, Adouna, Karaji and Anekar, in the Tahoua District (now a Department) and one at Gounfara, in the Birni-Nkonni District (now a Department). Three of the irrigation schemes developed from the construction of the structures (Kounkouzout, Adouna and Karaji) are under off-season crops, upstream and downstream from these structures. The Kounkouzout scheme was also intended to be farmed downstream using irrigation. The Gounfara scheme was designed to be continuously watered by a series of weirs. The Anekar site, on its part, was to be exclusively reserved for pastoral purposes.

2.2.2 The Project had four main components: (i) Development, (ii) Implementation, (iii) Support Measures, and (iv) Project Unit. The main outputs envisaged were: (i) construction of five rural water supply structures with variable characteristics (small dams and weirs), (ii) development of 90 ha of gravity-irrigated areas and of 720 ha of irrigated and flood recession crops, (iii) rehabilitation of 43 km of tracks, (iv) SWC works on 2,425 ha and development of 80 ha of plantations, (v) intensification of rain-fed cropping on 11,490 ha., (vi) construction of 15 boreholes and 45 village and pastoral wells, (vii) training and technical supervision of farmers, (viii) promotion of measures in favour of women, (ix) establishment of two land commissions, and (x) setting up of a guarantee fund to facilitate associations' access to credit.

### **2.3 Project Origin and Formulation**

2.3.1 PMET, identified in 1990, was aimed at the optimal management of water resources while taking into account the effects of the degradation of natural resources and the need to preserve and develop the productive capital of this area. The Project was prepared with the support of the Bank, which financed the study on run-off water harnessing in the three regions of Niger worst hit by drought: Tahoua, Zinder and Agadez. Ten micro-dams were selected from the 25 sites considered priority, and had feasibility studies conducted on them, taking into consideration the priority needs expressed by the population. Half of the 10 sites studied at the feasibility stage were located in Tahoua Department, and were selected for development under this Project. Appraisal of the Project could only be conducted five years after the completion of the studies owing mainly to the sanctions imposed on Niger in the mid-1990s.

2.3.2 The project area is characterized by very advanced soil degradation, resulting from water and wind erosion as well as deforestation. Villages in the area suffer from chronic water shortage and, during the dry season, very long distances have to be covered in search of rare wells to supply water to the population and livestock. The project design thus opted for erosion control while favouring the spreading of water in the valleys to facilitate flood recession and off-season cropping while organizing soil protection and restoration (SPR) and soil and water conservation (SWC) for improved rain-fed agriculture yields and fodder supply. The population was closely involved in the Project's preparatory phase. The Project also made provision for a physical contribution from the population for certain works and financial participation for maintaining the various structures and facilities put up. The technical options adopted automatically incorporated environmental aspects and additionally planned a tree and fodder shrub-planting programme around the impoundments.

The irrigation schemes proposed were small-sized and easy-to-manage, and designed to avoid any population displacement and extensive deforestation. The prior experience acquired by the population in the management of village lands was also a contributing factor for the implementation of the infrastructure development and environmental measures planned under the Project.

### **3. PROJECT IMPLEMENTATION**

#### **3.1 Loan Effectiveness and Project Start-Up**

3.1.1 Loan effectiveness was subject to the fulfilment of the general conditions stipulated in the Loan Agreement. First disbursement was subject to fulfilment of the following conditions precedent: (i) provide the ADF with evidence of the creation of the Project Management Unit within the Rural Engineering Department (DGR); (ii) provide evidence of the appointment of the Project Director whose qualifications and experience must be submitted to ADF for prior approval; (iii) provide evidence of the creation of a steering committee (SC) to ensure compatibility of national orientations with Project objectives; this Committee was to be headed by the Prefect of Tahoua ; (iv) undertake to submit for prior ADF approval, the agreement between the Project and Rural Credit Intermediation Service (SICR/Kokari) concerning the monitoring and management of the guarantee fund. The loan granted by ADF was also subject to another condition requiring that ‘the Government submit to ADF for prior approval, the agreement concerning the monitoring and management of the guarantee fund, no later than 31 December 1999’.

3.1.2 The ADF loan, worth UA 7.95 million, was approved on 15 July 1998 while the Loan Agreement was signed on 12 November 1998. All conditions precedent to first disbursement were subsequently fulfilled, leading to loan effectiveness on 7 April 1999, less than 5 months after the signing of the Loan Agreement, which constitutes a creditable performance on the part of the Borrower. However, despite this good performance, field implementation could not really start until March 2001, due to the disbursement suspension measures imposed on Niger from August 1999 and February 2001 for ADF debt repayment arrears.

#### **3.2 Modifications**

3.2.1 The main modifications effected during Project implementation mostly involved operational and technical adjustments to Component A, necessitated by the time lag between the preparatory studies conducted in the early 90s and actual Project start-up (about 10 years). The main modifications involved (i) abandoning the construction of the Anekar dam, due mainly to the expansion of the *Kori* bed and resulting in increased cost of the structure and requiring the displacement of the population; (ii) the replacement of the Kounkouzout dam and irrigation scheme with three flood diversion weirs; and (iii) the replacement of 15 shallow boreholes by two mini-DWS structures, owing to the hydro-geological context of the area and the acuteness of the needs of the villages concerned. The ‘Food for Work’ operation of the World Food Programme was initially not planned during Project design, but was highly beneficial during the implementation of the SWC/SPR works by the population.

3.2.2 It is worth indicating that the operational modifications carried out did not adversely affect the final Project outcomes, but rather contributed very significantly to enhancing the positive impacts expected at Project appraisal. All technical modifications were submitted for the prior approval of the Bank, which was able to determine, during supervision missions and

through regular communication with the Project, the relevance of the proposed adjustments and responded positively to the requests submitted to it. Institutionally, the Project shifted from the supervision of the Ministry of Water Resources and the Environment to that of the Ministry of Agricultural Development (MDA), due to the transformation in 2000 of the Rural Engineering Department (DGR) into the Department of Rural Agriculture Development and Equipment (DAERA), under the MDA.

### **3.3 Implementation Schedule**

The Project was to be implemented in 60 months, from 1999 to 2004. It was actually implemented in 74 months or 14 months behind schedule. However, because of the sanctions imposed on the country starting August 1999, that is, three months after loan effectiveness through to March 2001, project implementation could not start until April 2001. If account is taken of the sanction period, it means the Project experienced slippage of 31 months with an implementation duration of 91 months, from July 1999 to June 2007. This delay did not adversely affect the quality of the expected outcomes.

### **3.4 Reporting**

Under the contract for project implementation, the Project Management Unit (PMU) was required to provide reports to enable the Bank monitor the progress of activities. During the six years of Project implementation, the PMU regularly produced quarterly and annual reports that were submitted to ADB, the authorities and national and regional supervisory technical departments. Each year, three quarterly reports and an annual report incorporating the 4<sup>th</sup> quarter report were prepared and submitted at the Steering Committee meeting together with the activity programme for the new year. The Project thus produced and submitted to various partners and the Bank 16 quarterly reports and 5 annual reports, in addition to the mid-term review and final project evaluation reports.

### **3.5 Procurement**

The procurement methods stipulated in the Loan Agreement were complied with: (i) International Competitive Bidding (ICB) for the irrigation facilities; (ii) National Competitive Bidding (NCB) for the other works; (iii) Local Shopping (LS) for the procurement of goods; (iv) Shortlisting for the procurement of services, and (v) Direct Contracts for the agreements and memoranda of understanding with the Permanent Secretariat of the Rural Code (SP/CR), the Environmental and Impact Assessment Bureau (BEEI), the Niger National Institute of Agricultural Research (INRAN), the SICR/KOKARI Cooperative and government technical departments. The procurement modalities outlined in the Loan Agreement were followed. It must be indicated, however, that the training of management staff was not provided through shortlisting, but by specialized training institutions selected following the Bank's approval of the overall training plan. In addition, as a result of the WFP intervention, the Project was saved from procuring, through national competitive bidding, the services of a contractor for the SWC/SPR works, which were, in this case, undertaken by the beneficiaries themselves. It must further be pointed out that the Project Team received training in procurement procedures in 2001, and no specific problems or complaints were recorded during the procurement process. Overall, the Project signed 83 contracts and 33 memoranda of understanding. The Bank's no-objections were issued in a very timely manner (average of 33 days). The tables in Annex 5 present the status of the key contracts and agreements.

### **3.6 Project Cost, Sources of Finance and Disbursements**

3.6.1 Project Cost: The project cost excluding taxes and customs duties, including the 10% provision for physical contingencies and 4% provision for price escalation, was estimated in 1998 at UA 8.97 million, or CFAF 7,363 million at the time, comprising UA 5.89 million in foreign exchange and UA 3.08 million in local currency. The Project was jointly financed by ADF, the Government and the beneficiaries. The ADF loan covered 88.6% of the total project cost excluding taxes and duties or UA 7.95 million. This contribution covered the entire foreign exchange cost and 23% of the local currency cost. At completion, the Project cost stood at UA 10.42 million, or 116.2% of the initial estimated cost. This increase stems essentially from the initially unplanned involvement of WFP (cf. Annex 3).

3.6.2 ADF Disbursements: Between 30 March 2001, date of first disbursement, and 9 August 2007, date of final disbursement, the entire loan amount (UA 7.95 million) was disbursed, thus representing a 100% disbursement rate at completion. The Bank approved during Project implementation two revisions of the list of goods and services. The last such revision, in November 2006, was intended to correct certain posting errors and take account of the fact that the Government had contributed considerably to the 'works' category. The 'works' and 'operating cost' categories were slightly increased, from 56 to 59% and from 2 to 4%, while the 'service' category was slightly reduced from 29% to 24%. At the end of the Project, the 'Development' component accounted for nearly 59% of consumption. Annual disbursements were regular as from 2002, with consumption consistent with the pace of implementation. All in all, the Project was not subject to UA fluctuations, which were generally offset over time. Annex 3 gives details of ADF disbursements by category and by year.

3.6.3 National Counterpart Funds: Concerning the national counterpart funds, a total amount of CFAF 695,649,806 was mobilized between 2001 and 2007, sometimes with some delay that affected implementation. It was used mainly for the construction of the irrigation structures and the Project head office. At the end of the Project, an amount of CFAF 57,047,513 was however still owed to four contractors that built the weirs, because a quarter of the 2005 counterpart amount was not released to the Project. The population's contribution was, on its part, estimated at CFAF 488,674,063, representing the value of their physical participation in some of the works and also the raising of funds prior to certain activities. As at the end of the Project, the contribution of the Government and the population accounted for close to 14.6% of the total project amount, which is higher than estimated at appraisal (11.4%).

3.6.4 WFP Financing: The WFP's contribution, which was not planned initially, is estimated at over CFAF 864.7 million, consisting mainly of the supply of food items to the SWC/SPR sites.

## **4. PROJECT OUTCOMES AND PERFORMANCE**

### **4.1 Outcomes by Component**

4.1.1 Based on the estimated Project outcomes as specified in the logical framework, assessment of the data at completion makes it possible to determine the level of attainment of the objectives. The main outcomes obtained by component are reviewed as follows:



## COMPONENT A: DEVELOPMENT OF IRRIGATION AND EROSION CONTROL STRUCTURES

*Outcome 1: Five water harnessing structures built, allowing the development of 630 ha of land for flood recession cropping.*

4.1.2 As indicated above, changes were made to the choice and features of the structures for which the studies were relatively old in order to adapt them to the needs of the beneficiaries and the Project. Consequently, the Anekar pastoral dam was abandoned due mainly to the expansion of the Kori bed (increased cost of structure) and the need to displace the population. For technical and economic reasons, the Kounkouzout dam and irrigation scheme were replaced by three flood diversion weirs at Kounkouzout, Alibou and Minao. For the Adouna site, it was decided to build a new structure to replace a faulty weir built in 1997 with German cooperation funding. In addition to the five sites planned in the appraisal report, a decision was taken to study and develop a sixth site (Lilango) located about 10 km downstream of the Adouna site.

4.1.3 With the modifications introduced, 8 major agricultural water supply structures were built with six in Tahoua Department (Karadji Nord, Lilango, Alibou, Minao, Bagaye-Kounkouzout and Adouna) and two in Konni Department (weirs at Gounfara). The works started end March 2003 and the last sites (Gounfara) were completed early July 2005. Overall, there were slippages ranging between 6 to 18 months on the execution of contracts. These slippages mostly stemmed from the poor organizational performance of the national contractors. Notwithstanding these difficulties, and thanks to the strong involvement of all stakeholders, all the sites were completed.

4.1.4 The area finally covered by all the structures is 998 hectares of land (930 ha upstream for flood recession cropping and 68 ha downstream for flood diversion cropping) against the 720 ha targeted in the Loan Agreement. During the rainy seasons (July to September) from 2004 to 2007, it was observed that the structures held, without any major problem. The structures were built in conformity with required standards and with good quality material (galvanized wire gabions, geo-textiles). The Project also systematically supported the emergence of a management committee on each site and the institution of a user fee system for maintenance of the facilities.

*Outcome 2: Kounkouzout dam developed, allowing storage of 1.3 million m<sup>3</sup> of water for water supply, gravity irrigation of 90 ha and development of 70 ha of flood recession cropping.*

4.1.5 As indicated above, the Kounkouzout dam and irrigation scheme were abandoned and replaced with a series of weirs in the same valley at Kounkouzout-Bagaye, Alibou and Minao. The flood recession cropping potential for the 3 sites is 245 ha.

*Outcome 3: To protect structures built, agro-forestry erosion control works undertaken on 80 ha, divided between Kounkouzout (25 ha), Gounfara (25 ha), Anekar (10 ha) and Adouna (20 ha). 7 km of bank protection works carried out at Kounkouzout and Anekar.*

4.1.6 Instead of the stabilization of the banks of the *koris* with the planting of soil-fixing species and given the precarious nature of this method, the Project opted for the erection of transverse and longitudinal structures in resistant material (gabion, concrete, etc.) on the *kori*

beds. The Project actually only planted 10 ha of vegetation over 11 km around the Adouna retention structure. Bank protection works were, however, carried out on 4 different sites: 1,735 ml of longitudinal gabion protection, 2 correction gabion weirs, 1 cyclopean concrete weir and 4 gabion diversion spurs. These works helped to protect 11.5 km of *kori* banks. The gabion structures aided sedimentation of the *koris* and the protection of the banks against erosion. However, the revegetation of the sandy watered areas and planting of bank protections were not very successful. The success rate for the planting was below 27%. The agro-forestry works were therefore generally insufficient.

*Outcome 4: SWC/SPR works undertaken, allowing the recovery and protection of 2,425 ha, broken down into 1,430 ha at Kounkouzout, 835 ha at Gounfara and 160 ha at Anekar.*

4.1.7 With regard to erosion control, the Project made provision for works, on contract basis, of 2,425 ha of cultivated pediments, at a cost of CFAF 180,000/hectare. From the first crop season in 2001/2002, the Project supported the carrying out of erosion works through the 'Food for Work' system with food supplies procured from the national budget. As from October 2004, following the partnership with WFP for support in the form of food supplies, 8,871 ha were finally protected using rock dikes or half-moons, enabling the Project achieve 3.6 times the initial objective set. ADF covered the cost of transporting the stones. In the end, the Project obtained a lower unit cost than estimated (CFAF 145,000/hectare improved).

## COMPONENT B: IMPLEMENTATION

*Outcome 5: Technical supervision put in place, allowing the participatory training of 1,539 farmers*

4.1.8 The Project, through a national NGO, helped with the emergence of 217 grassroots Producer Organizations (POs), 6 PO Unions, 7 market gardener's cooperatives and 16 input shop management committees, making a total of 246 bodies bringing together producers. In addition, 169 contact groups were formed for extension purposes. Most of the POs were able to develop activities though the loans distributed by SONIBANK with the intermediation of SICR/KOKARI (cf. result 6). Furthermore, 7 market garden cooperatives were created, with the key mission of organizing agricultural production on the developed sites as well as the maintenance of community structures (weirs and dams). These 7 cooperatives bring together 1,182 producers, or 58% of the 2,017 farmers on the land watered by the structures. Each cooperative instituted a user fee system and opened an account at a local MFI.

*Outcome 6: Guarantee fund of CFAF 150 million deposited at local banks to provide credit to rural organizations for the financing of short- or medium-term activities. Agreement signed with Rural Credit Intermediation Service (SICR) for credit advisory and monitoring services.*

4.1.9 The credit was granted by SONIBANK, a commercial bank with a branch at Tahoua, while SICR/KOKARI served as the intermediation agent. Credit activities started in July 2002, and credit facilities extended were on the short-term, usually between 6 and 9 months. The plan put in place functioned very well, allowing the mobilization of a credit volume to the tune of about CFAF 1.244 billion including 25% of personal contribution. The recovery rate observed at the end of the Project, excluding the mobilization of the guarantee fund, averaged 97%. This excellent recovery rate stems from the strong involvement of the three KOKARI officers on the ground and the strict application of the recovery rules. As at the end

of Project, taking into account the accumulated interests and loan repayments (50% of outstanding payments, or approximately CFAF 17 million), the balance of the guarantee fund account was higher than the initial investment (CFAF 184.6 million compared to CFAF 180 million, at its opening in 2002).

4.1.10 The credit facilities extended provided financing for 185 groupings (including 104 women's groups), or 12,862 beneficiaries (including 8,229 women), in activities such as sheep fattening, petty trading, purchasing of inputs, millet storage, livestock trading, etc. The purchasing of production equipment (carts, animal traction units, wells, pumping equipment, etc.), as planned at appraisal, was limited and was only possible through collaboration with the World Bank-funded PIP2 Project, which subsidized up to 80 to 90% of the cost of such equipment. Only the remaining 10 to 20% was taken out as loans through PMET. Under this collaboration, 34 wells and 36 market gardening boreholes were built while 97 carts and 123 motor pumps were purchased.

4.1.11 To ensure the sustainability of the credit activity, which has performed exceptionally well, the Project, with the support of the Rural Credit Unit of the MDA, proposed to the Bank a new mechanism establishing a direct link between SONIBANK and KOKARI. Under this mechanism: (i) SONIBANK refinances KOKARI at a consensus interest rate; (ii) KOKARI grants credit directly to the population, strictly in compliance with its credit policy; (iii) the relations between KOKARI and SONIBANK are established on a purely commercial basis; (iv) the Government agrees to leave the revolving fund at SONIBANK to guarantee the refinancing of KOKARI; and (v) a monitoring committee is set up to supervise the credit activities. The mechanism was approved by ADB in January 2007. The new mechanism became effective on 30 June 2007 and by 15 March 2008 CFAF 250 million of credit had already been constituted. It is safe to conclude that a highly encouraging start to the sustainability of rural credit has been set in motion.

*Outcome 7: Three-year agreement signed with INRAN for research-development activities, and productivity of agricultural activities in the area improved through dissemination of research findings.*

4.1.12 Under the agreement, PMET entrusted to INRAN the implementation of activities relating to the farming (cultivation methods, manuring, seed production, diversification, etc.) and pastoral (breed improvement, livestock feed, development of fodder crops, etc.) components. The extension and training activities supported by those of research and development proved really effective and covered over 14,000 farmers and increased yields of rain-fed crops by 22% to 36% and off-season crops by 27% to 498%, depending on the crops and methods used. The Project allowed the introduction of an improved seed production system (213 tonnes produced) through seed-growing groupings (150 producers trained) and the setting up of operational input shops.

*Outcome 8: 720 ha of flood recession crops and 11.490 ha of intense rain-fed crops cultivated yearly under the Project.*

4.1.13 The results exceeded the projections considering that, as indicated above, the area influenced by the irrigation structures is 998 hectares and the area under intense rain-fed cropping is estimated at 16,871 ha (8,871 ha of SWC/SPR and 8,000 ha covered by extension services). All the land developed through the various improvements is now under cultivation and effectively exploited. The major crops grown are millet and sorghum, during the rainy

season, while during the off-season the most widely grown crops are tomatoes (for drying and export), sweet potatoes, onions, cowpeas and Irish potatoes. Since the Project area is seriously deficient in cereals, this production is largely home-consumed. The Project is thus ensuring food security.

### COMPONENT C: SUPPORT MEASURES

*Outcome 9: 41 km of tracks rehabilitated to improve access to certain villages and 15 community stores built for produce and inputs.*

4.1.14 Three sections of tracks were rehabilitated, making a total of 37.2 km. Their rehabilitation has helped improve access to 8 major villages. It should be pointed out that the engineering designs included extensions for the tracks rehabilitated, but budget constraints did not allow the carrying out of these extensions. The proper implementation of the works, judicious choice of itineraries and setting up of track maintenance committees contribute to the sustainability of the effects observed. The maintenance committees carried out regular maintenance of these tracks under the Project, but it is advisable for the communities to take over.

4.1.15 The Project co-financed with the villagers the construction of 14 community stores in semi-hard material and the rehabilitation of an old store. The initial option to use permanent material was modified, to be more consistent with the policy of Niger on low-cost storage facilities and making use of the population's contribution (brick making). Originally, these multi-purpose stores were to be used for the preservation of fresh produce, but as from 2005, through collaboration with the 'FAO Inputs' project, these stores found other uses and became input shops. To start operating, each shop was provided an initial working capital of about CFAF 565,000, including CFAF 200,000 provided by the beneficiaries.

*Outcome 10: Five motor-pump operated boreholes in major villages, 10 manual pump-operated boreholes in small villages and 45 village and pastoral wells sunk by Project, and management teams trained for these facilities.*

4.1.16 Because of the hydrological situation of the area, the shallow boreholes programme initially planned was abandoned, and the resources were instead used for two mini-DWS units at Kounkouzout/Bagaye (rehabilitation and extension of an existing mini-DWS unit) and Gounfara (borehole and new mini-DWS). During the initial participatory needs assessment, it emerged that these two centres were faced with serious drinking water supply problems, and that any rural development action had to first address that problem. Eighty-four (84) cement wells were sunk, 61 of which were positive, meaning that they met the standard of constant water delivery under good conditions. It was observed that surroundings of the wells varied depending on the site, despite the initial identical awareness and organization measures put in place. The circular livestock watering system integrated into the wells appeared to inconvenience users (inability to directly fill the watering units) and is therefore rarely used. The 2 mini-DWS management committees each financed from their own resources the purchasing of a stand-by generator and the construction of a new shelter in permanent material.

*Outcome 11: Two land commissions set up in the Tahoua and Birni Konni Departments*

4.1.17 In accordance with the provisions of the Loan Agreement, PMET, as part of the agreement signed with the Permanent Secretariat of the National Rural Code Committee (SP/CNCR), assisted with the creation and functioning of the Tahoua and Konni Land Commissions (COFO), as well as the training of its staff. A vehicle was procured for each COFO, which in turn assisted with the emergence of 142 local COFOs including 42 in the PMET area. These actions allowed the dissemination of the rural code provisions, preparation of title deeds, keeping of rural land records, mediation and settlement of land matters at the different sites and curbing the risk of conflict. The setting up of the COFOs has contributed to the clarification of land issues on the schemes built by PMET and better dissemination of the Rural Code. The operation of the COFOs appears to be too dependent on the financing of projects, which further limits their scope of intervention, and is also hampered by some reluctance on the part of the administrative and traditional authorities.

*Outcome 12: Concrete measures in favour of women in the area of health, organization and credit*

4.1.18 The 10 health huts planned were built, equipped and stocked with an initial supply of medicines. The health services helped with the setting up and training of the management committees and carried out the selection of community health workers. These health huts are currently operational, well appreciated by the population and integrated into the health coverage and monitoring mechanism of the Tahoua Regional Directorate of Health. The Project also contributed to the rehabilitation and equipping of the Bagaye IHC as well as the equipping of the Adouna IHC. Overall, the Project contributed to improving primary health care in its area of intervention. The credit facilities provided have had a highly beneficial impact on the economic activities of women, who relieved of time-consuming water fetching and cooking (dissemination of improved stoves) chores, increasingly engage in income-generating activities (livestock fattening, petty trading, etc.).

*Outcome 13: Agreement signed with Environmental and Impact Assessment Bureau (BEEEI) to ensure proper environmental monitoring of Project activities.*

4.1.19 The Project produced in 2003 an environmental impact assessment outlining the expected negative and positive impacts of its activities, particularly with respect to the irrigation facilities, tracks and village wells. This assessment was followed by the preparation of an Environmental and Social Management Plan (ESMP), which was to be implemented and monitored by BEEEI, in conformity with the provisions of the Loan Agreement. A Regional Environmental Surveillance and Monitoring Unit was also established in Tahoua in March. Implementation of the ESMP involved the organization of several training sessions for the technical departments and among the population, as well as supplementary studies on the prevalence of water-borne diseases and certain plant inventories. These measures contributed to skills enhancement and better hygiene around water points. PMET thus contributed to the initiation and concrete implementation of national policies on environmental impact assessment and monitoring in the Tahoua region.

## COMPONENT D: PROJECT MANAGEMENT

*Outcome 14: A Project Management Unit (PMU) comprising the Director, 5 local management staff and technical assistance staff put together and placed under the Ministry of Water Resources and the Environment.*

4.1.20 The Project Team was put together as planned, and it comprised a Rural Engineer and Director of PMET Director, an Administration and Finance Manager, a Rural Engineer in charge of the Development component, an Agronomist for Implementation, an Environmentalist for Environmental Monitoring, and a Sociologist for Monitoring-Evaluation. The calibre and highly qualified profile of the team that implemented the PMET should be underscored. The professionalism and commitment of the PMET Director and the various experts, with the effective support of the administrative authorities, contributed significantly to the results achieved by the Project. The team also benefitted from the efficient support of a technical assistance team for 3 years. As stated above, the Project fell under the supervision of the Ministry of Agricultural Development (MDA), following the attachment of the DAERA to the MDA.

*Outcome 15: Office built in Tahoua and equipment procured*

4.1.21 The Project financed from the counterpart funds, a building for its offices in Tahoua while the equipment was procured from the ADF funds. The construction works for this building lasted nearly three years. The construction of the documentation room and paving of the compound were financed from the ADF funds. The offices built are in good condition and are about to be reassigned to the Tahoua Regional Rural Engineering Department.

## **4.2 Institutional Performance**

4.2.1 The Steering Committee regularly discharged its duties at annual meetings. Its deep involvement and thoroughness largely contributed to addressing problems encountered in the Project's implementation: change in initial programmes for weirs and tracks, delays in works execution by contractors, etc. The project was regularly supervised by ADB (11 times) and by the Ministry of Agricultural Development (12 times). The Project was steered satisfactorily. Project management was entrusted to an independent administrative body responsible for the technical, administrative and financial administration management. During its implementation, PMET submitted to the Bank, all audit reports for fiscal years 2001 to 2007. The administrative and financial management was generally well organized by the PMET team and the various audits regularly stated the reliability and consistency of the financial statements and compliance with Bank procedures. The mid-term review and final evaluation missions were conducted under good conditions. A monitoring-evaluation mechanism was set up to help produce timely activity reports, as well as estimate the outputs and revenues at the different sites. The evaluation noted the very good performance of the Project team, which demonstrated competence and commitment.

4.2.2 The Project formalized its links with the Territorial Administration Services and Technical Services through sub-regional technical committees and a regional consultative committee made up of the Regional Directors of the relevant services. These Committees functioned properly with periodic field visits, followed by recommendations for the Project. This mechanism made for good collaboration between the Project and the technical services, some of which underwent training and also provided specific agreement-based services

(implementation of SWC/SPR works, study and control of works of certain structures, literacy activities, etc.). PMET presents an interesting project/technical services interfacing experience, which is highly sought after but rarely achieved.

### **4.3 Performance of Consultants, Contractors and Suppliers**

4.3.1 Consultants: The Project made use of several consultants for technical assistance in areas such as rural engineering, studies and works control, extension activities, mid-term review, final evaluation and accounts audit. The firms satisfactorily discharged the duties assigned them. The rural engineering technical assistance provided ample support for the preparation of the bidding documents, procurement, and site monitoring, as well as in the area of social relations and method of work. The community mechanism (one supervisor and 10 instructors, including five women) on the ground helped the NGO recruited for extension work to conduct several training and awareness activities. The mid-term reviews and final evaluation were carried out in a participatory manner.

4.3.2 Contractors: The Project awarded several works contracts for the various improvements and infrastructure. With regard to the irrigation structures, the poor organization of contracting firms, coupled with their equally poor technical, material and financial capacities led to several delays. These delays ranged from eight (Lilango, Alibou, Minao and Karadji) to 18 months (Gounfara) depending on the sites. Despite field visits by Project Officers and discussions with the contractors, the unsatisfactory progress of the works led the Project to organize several monitoring meetings in Niamey and Tahoua, in addition to the normal supervision and control procedures. The increased monitoring and penalties imposed ensured completion of the project and delivery of the various works, while ensuring their compliance with quality standards.

4.3.3 Suppliers: Suppliers generally met their commitments. In particular, transport, computer and office equipment were delivered in a timely manner and proved satisfactory as they were of good quality.

### **4.4 Financial Performance**

The Project had envisaged an increase in people's incomes, based on additional proceeds to the tune of CFAF 2.098 million for the major additional outputs. During the 2004-2005 and 2005-2006 crop years, the Project set up a produce monitoring system. Based on the results of these farming seasons and further surveys, the average increase in the incomes of 2,017 farmers benefiting from the hydro-agricultural facilities was estimated at CFAF 280,000. It was not possible to quantify revenue growth linked to activities financed by the credit facility, but these are as real and quite often significant. In the absence of a baseline situation, steps were not taken to measure additional stock breeding, which is quite substantial, given the improved watering conditions, increase in fodder production on reclaimed land and off-season cowpea, not to mention the share to feedlot credit and extension activities. The rural access roads also had an effect on revenue, as they facilitated produce marketing.

## 4.5 Economic Performance

Based on the results of the 2004-2005 and 2005-2006 farming seasons, the economic calculations made are to the tune of CFAF 572 million, the additional revenue linked to the farming season structures, and CFAF 442 million for the SWC/SPR improvements. To calculate the internal rate of return (IRR), the following were taken into account: (i) for outputs, Project-related additional revenue, and (ii) under expenses, the amount of investments, operational costs for additional production, and the maintenance cost of the structures and improvements. Simple assumptions were made: maintaining production for 25 years for the production observed over the 2005-2006 period, maintaining production costs at current levels, and maintaining the crop rotations observed in 2005-2006. In this respect, the IRR of the structures is 6.8%. This relatively modest rate stems from: (i) the relatively high cost of the structures (CFAF 3.1 million/ha on average), and (ii) investments which depreciate over one farming season only. Moreover, these assumptions do not take into account the progress margins resulting from better knowledge of intensive rain-fed cropping acquired with time or the phased extension observed in the structures downstream. This is why the 6.8% IRR should be considered as a minimum rate. For the erosion control improvements (SWC/SPR), the IRR is estimated at 18.9%. This good financial return stems from a low investment level (CFAF 144,000/ha) and very good agronomic response (yields multiplied by 3) on the relatively fertile clayey soils in the Tahoua region. The overall internal rate of return, which, apart from the irrigation structures and SWC/SPR improvements, includes intensive rain-fed cropping tied to extension activities, was estimated at 13.1% and generally seemed satisfactory, taking into account the prudent assumptions made and the failure to take into account the effects of increased stockbreeding and certain credit activities.

## 5. PROJECT SOCIAL AND ENVIRONMENTAL IMPACTS

### 5.1 Social Impact

5.1.1 In its area of intervention, the Project's impact on poverty reduction is significant. The social impacts related to the Project's activities were observed during the completion mission, following testimonies by the people and through the field visits. These impacts were also analyzed at final evaluation by a consultant and also through the PMET monitoring-evaluation mechanism. Discussions with the population during the completion missions revealed interesting remarks, such as: "with the intervention of the Project, we are able to honour our commitments; there is no more famine; able-bodied people no longer leave the region; our incomes have increased; our living conditions have improved, women spend less time fetching water; young girls from other villages prefer to get married to our men; we have learnt to know each other better; the ties between our villages have strengthened; we want to pursue and intensify the activities carried out, etc...".

5.1.2 The Project has undoubtedly had major social impacts at all these centres of intervention. The initial participatory diagnosis enabled the villagers to analyze together, the causes of their problems within the context of the ecological, economic and social trends so as to consider and envisage basic solutions. This joint reflection constitutes important social progress, which allows for greater participation by the population in local and communal development. Capacity building activities led to the emergence of 630 rural organizations, which were trained and structured. The functional literacy drive helped to teach 657 people to read and write, with most of them assuming responsibilities in various organizations. The



introduction and development of credit had marked impact on the people, especially women. Incomes drawn from the credit helped to meet the households' additional cereal requirements, and the secondary and tertiary needs of the family, including their participation in family ceremonies.

5.1.3 The Project contributed immensely to meeting food requirements, following a sharp growth in crop (7,200 tonnes of millet/sorghum and 8,600 tonnes of market-garden crops) and animal production. It also helped improve water supply for over 33,000 people (17,000 for the 2 mini-DWS units and 16,000 for the wells). Good quality water became available in all seasons and time savings resulting from the proximity of water helped to ease the burden of domestic chores. The establishment of 10 fully functional health huts and two integrated health centres helped the villagers gain closer access to primary health care. The construction of the three tracks contributed to the economic development and improved access for eight big villages and hamlets, with a population of 102,000 inhabitants. Vehicles could now access the villages directly, thereby reducing travel time and transport costs. The tracks have also facilitated the marketing of produce and improved social relations and access to administrative services.

## **5.2 Environmental Impact**

5.2.1 Classified under Category II, the Project mainly entailed the construction of small infrastructure (irrigation structures, wells, buildings, tracks, etc.) with no major negative impact on the environment. Water harnessing and degraded land reclamation activities highly contributed to preservation of the natural habitat and curbing soil erosion. At the end of the Project, marked improvements were noted on the regeneration and management of the productive capital, "water, land and vegetation", in particular, through the creation of new fodder resources, limiting run-off and curbing water erosion, restoring degraded soils and greening moisturized zones. In all, nearly 18,000 hectares of land benefited from the Project's positive effects.

5.2.2 In 2003, the Project produced an environmental impact assessment on the expected negative and positive impacts, followed by the drawing up of an environmental and social management plan, whose implementation and monitoring were entrusted to the Environmental and Impact Assessment Bureau (BEEEI). A regional environmental surveillance and monitoring unit was also set up in March 2003 in Tahoua. The implementation of the Environmental and Social Management Plan (ESMP) led to several training sessions at the technical departments and among the population. It also led to additional studies on the prevalence of water-borne diseases and the inventory of certain plants. These measures contributed to skills enhancement and improved hygiene at the water points. PMET contributed to the concrete implementation of national policies on environmental impact studies and monitoring in the Tahoua region.

## **6. PROJECT VIABILITY**

The Project installed nearly all the water harnessing structures planned at appraisal, and the SWC/SPR improvements. These simply designed structures were built satisfactorily and according to standards. The weirs and small dams may have a lifespan of over 30 years, with minimum maintenance. They have proved their worth and ownership by producers for three crop years now. The same is true for the socio-economic infrastructure and tracks, which are in a good state of repair and operational. The management committees for these

improvements and infrastructure have been set up and are generally operational. They will be able to easily carry out simple maintenance works. While the conditions for the sustainability of the PMET's current impacts are present, this in no way serves as a definite guarantee for the future. These committees have only just begun and lack experience, making it necessary to continue supporting them. In this regard, the role of the technical services appears essential in this post-completion phase of the Project. In terms of credit, the Government has made arrangements, through the memoranda of understanding with SONIBANK and SCIR/KOKARI, and the first results bode well for the sustainability of the system in place.

## **7. PERFORMANCE OF THE BANK, THE BORROWER AND WFP**

### **7.1 Performance of the Bank**

The Project was designed taking local conditions into account, and it relied on Bank-financed feasibility studies. This contributed to sound formulation. The loan effectiveness (7 April 1999) occurred shortly before the beginning of the suspension period of the ADB disbursements, which only ended in March 2001. As from that date, the Bank met all its commitments by providing the Project financial resources as per the loan agreement. The ADB project officers and the PMET Director forged efficient working relations, and exchanged emails prior to processing the documents. This enabled the Bank to react in a timely manner and have a good grasp of the issues. Promptness in the processing of documents played a major role in Project implementation. Disbursements, on the other hand, were not carried out as efficiently, with delays reaching three months. This proved to be a constraint to the Project's cash management and payment of service providers. Lastly, ADB regularly undertook supervision missions (11 missions). The Bank's performance was satisfactory on the whole.

### **7.2 Performance of the Borrower**

The Government, through its Territorial Administration and technical services, largely met its contractual obligations satisfactorily. It mobilized a competent team and fulfilled its financial counterpart, albeit with some delay. At the end of the Project, the Borrower's overall financial participation was CFAF 697 million – exceeding initial estimates of CFAF 657 million. It must be pointed out that the last 2005 counterpart budget payment was not made, leading, at the end of the Project, to arrears slightly in excess of CFAF 57 million in payment to the contractors that built the weirs and the dam. The Ministry of Agricultural Development, which played a supervisory role for the Project, was active in its implementation, by organizing supervision missions, support and regular meetings of the Steering Committee. The regional and departmental services were also deeply involved in the Project. Consistent with the participatory approach, the people were at the heart of decision-making and gave their physical and/or financial contribution to the various works. The Borrower's performance was highly satisfactory.

### **7.3 Performance of WFP**

From the 2003/2004 development campaign, and the partnership formed with PMET, WFP was efficient in providing regular and timely supplies to the work sites, in the quantities earmarked. The "Food for Work" interventions were appropriate for mobilizing the people and settling the youth, used to engaging in the seasonal exodus.

## **8. OVERALL PERFORMANCE AND RATING**

8.1 An analysis of the different criteria shows PMET to be very efficient. In its area of action, PMET has made significant progress towards achieving its goal to reduce poverty and improve the living conditions of the population, and especially ensure food security. Instances of self promotion by the rural population have been observed, with people planning for the future, and individuals and groups independently formulating strategies to improve their incomes. The key expected physical outputs of the Project have been achieved and quite often largely exceeded, with satisfactory quality overall, and encouraging sustainability prospects. Apart from building the capacities of the beneficiary populations and supporting local development, the Project's outputs and activities have laid the ground for sustainable development (income generation and food security through water harnessing) and also helped to meet priority needs (cash injection, access to basic services, development of income-generating activities).

8.2 At the end of the Project, the few flaws noted do not pose any major problems. These include: (i) the low success rate in planting activities; (ii) unsatisfactory performance of local contractors, who delayed in the works execution, without undermining the work quality; (iii) the lack of dynamism of the management committees of the irrigation structures and the poor involvement of the communes; (iv) failure of the technical services to continue monitoring, and (v) poor visibility of the Project's activities. With an average score of 3.6 out of 4, as calculated in the performance evaluation and rating matrix and presented in Annex 6, the general performance of the project appears to be highly satisfactory.

## **9. CONCLUSIONS, LESSONS LEARNT AND RECOMMENDATIONS**

### **9.1 Conclusions**

The project start-up was delayed by 18 months as a result of the suspension of ADF disbursements. This delay notwithstanding, the project was implemented under very satisfactory conditions following an outstanding mobilization of the government services, the beneficiaries and the Bank, all orchestrated and led by a dynamic and competent project unit. The Project, which is geared to addressing the constraints identified in a participatory manner, achieved and often exceeded nearly all its objectives. Indeed, PMET can be said to have contributed to poverty reduction and improvement in food security in its sphere of action, for a population of over 100,000 inhabitants. The beneficiaries in all the villages covered acknowledge that the hitherto recurrent famine in the region is a thing of the past, and the youths are now able to work all year long and are no longer compelled to leave the region. In this respect, PMET is a source of great satisfaction for both Niger and the Bank, and should serve as a benchmark and guide for successful rural development activities in which all parties stand to gain. These commendable outcomes should be widely disseminated and developed

### **9.2 Lessons Learnt**

9.2.1 The design, implementation and impacts of PMET are truly a success. Such a good outcome is rather rare for rural development operations and the reasons for this success are worth considering, so that they may serve as a lesson for future actions in the country or elsewhere. At completion, the success of PMET seems to lie in the following pillars:

- Simple solutions to essential problems: The relevance of the technical choices made led to the mobilization of the beneficiaries, and ultimately, the project's success. The theme "water harnessing" is especially relevant in the global context, where natural resources are depleting and Niger is facing dwindling rainfall.
- A participatory approach: A well-conducted participatory approach, coupled with constructive partnership is an essential factor for success. The Project team listened to the people and proposed the adjustments needed to optimize the resources available to ensure greater efficiency.
- Involvement and empowerment of all stakeholders: The Project closely involved the administrative authorities and various technical services, through memoranda of understanding and useful information.
- Calibre and professionalism of the project management unit: The competence and know-how of the PMET team undoubtedly contributed to the success observed. Spurred on by a firm and committed Coordinator, the PMET team did a professional job in gradually removing the constraints it had met and proposing the most efficient intervention areas. Indeed, the Project Coordinator received an expression of approval from the Governor of the Region, on behalf of the Head of State.
- Time invested in the development of facilities, and support to producers: Owing to the dynamism of the PMET team and despite the delays at some of the sites, the first facilities became operational less than three years following the start-up of activities. The Project team thus had enough time to support the producers in developing the irrigation structures and correcting some imperfections noted. When the Project ended, a learning process had already begun.
- Good responsiveness from the Bank: For its part, the Bank duly monitored the implementation of the Project, by way of frequent supervision missions and regular email contacts. The Bank further showed discernment in its fairly prompt processing of documents.

9.2.2 The very good implementation of the credit component constitutes an exceptional success against the backdrop of the usual difficulties involved in accessing and recovering credit in rural areas. The establishment of an efficient intermediation service that is close to the producers largely contributed to the good outcomes.

9.2.3 The weak capacity of local and national public works enterprises is a constraint to development projects in Niger and a threat to any meaningful development of the irrigation sub-sector. It is essential for the State and its development partners to engage in talks aimed at promoting the private sector in terms of building the capacities of enterprises and facilitating access to equipment credit.

9.2.4 To ensure the sustainability of the project's gains, it is important for the government's decentralized technical services, which were fully involved during Project implementation, to continue monitoring activities on the ground while building on the results obtained.

### 9.3 Recommendations

In view of the results and lessons observed upon completion of the PMET, the following is recommended:

- The Bank:
  - i) ensure, through all available channels of communication, extensive dissemination of the good results achieved by PMET;
  - ii) support the Government of Niger to fully capitalize and build on the successes achieved through the Project's interventions, in order to ultimately promote a real national strategy in the harnessing of water resources;
  - iii) take into account PMET's successful experience in rural credit, and compare it to other credit financing mechanisms supported by the Bank, in order to determine the extent and manner in which the experience could be customized, developed and reproduced;
  - iv) consider the potential of the Tahoua region and the needs expressed for the harnessing of water resources and for improved access to remote areas, and envisage a study for a second phase that is based on the lessons and achievements of the PMET;
  - v) examine, within the framework of its cooperation with the Republic of Niger, the ways and means of contributing to strengthening and equipping small and medium-scale enterprises involved in irrigation works;
  - vi) plan systematically, for future projects, the preparation of a baseline study prior to the start of implementation.
  
- The Borrower:
  - i) make all the necessary arrangements to settle, as soon as possible and no later than 31 December 2008 the unpaid balance on four contracts still owed some national enterprises, amounting to a total of CFAF 57,047,513;
  - ii) continue to ensure in the field, through the relevant technical departments, the follow-up of the PMET's activities and support to producers, so as to maintain the momentum set in motion and boost the sustainability of the various actions initiated by PMET. It would be advisable to earmark, in this regard, a graduated budget that will allow monitoring over three years and for which annual reports will be prepared, with the Bank as one of the recipients;

- iii) take the necessary measures at the different sites to ensure a simple hydrometric monitoring of the water flow, water surface and groundwater of the harnessing structures built;
- iv) promote in areas with water bodies the production of agro-forestry plants, to be procured by projects or NGOs, for the indispensable reforestation of denuded catchment areas, as part of combating desertification;
- v) ensure at the regional and national levels, the extensive dissemination of the PMET's results while developing the exploitation of the PMET's experience in the area of water harnessing, in coordination with the other Bank-financed rural development projects (PADAZ, PADL Diffa and PVDT);
- vi) make every effort to maintain the sustainability of the PMET credit component, through the implementation and close monitoring of the memoranda of understanding signed with SONIBANK and KOKARI. It would be advisable to consider the creation of a disaster fund in order to minimize the risks taken by the MFIs and thus guarantee their development and the sustainability of their assistance to rural communities;
- vii) promote the development and capacity-building of national enterprises specialized in irrigation schemes, in liaison with development partners, through training activities and easier access to equipment credit.

REPUBLIC OF NIGER  
**TAHOUA REGION WATER HARNESSING PROJECT (PMET)**  
**COMPLETION REPORT**  
**Project Location Map**



## REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)****COMPLETION REPORT****Summary Table of Project Outputs**

Key Activities by Component	Initial Objectives	Outputs at Closing	Implementation Rate (%)
<b>• Development</b>			
Water harnessing structures	5	8	160
Development of flood recession cropping areas	630 ha	998 ha	158
Irrigated area	90 ha	0	0
Rural access roads	43 km	37.2 km	86
Reclamation of land by SWC/SPR	2,425 ha	8,871 ha	366
Protection of <i>kori</i> banks	7.5 km	11.5 km	153
Vegetation of sandy watered areas	80 ha	80 ha	100
<b>• Implementation</b>			
Technical supervision of producers	1,539 farmers trained	1,690 farmers trained	110
Literacy education for producers	Not specified	657 people	-
Market garden cooperatives trained	7 coops.	7 coops.	100
Dev. of flood recession and irrigated cropping	720 ha	998 ha	139
Intensification of rain-fed cropping	11,490 ha	16,871 ha	147
Rural credit (Guarantee fund - GF)	Funds from 150 MF	Funds from 180 MF	100
N <sup>o</sup> of groups benefiting from loans	160 grps. (cf. agreement)	185 grps.	116
Total amount credit	CFAF 1,028 m (agrmnt.)	CFAF 1,249 billion	121
Rate of repayment	95% (under agrmnt.)	97% (excl.GF mobilis.)	102
<b>• Support Measures</b>			
Village & pastoral wells	45	84 incl. 61 positive	135
Equipped shallow boreholes	15	0	0
Deep boreholes	0	1 deep borehole	+
Mini-DWS	0	2 mini-DWS	+
Input shops	15	15	100
Community health huts	10	10	100
Finishing & equip't of IHC	0	2	+
Setting up of COFOS	2 COFOS	2 COFOS / 150 COFOB	100 / +
INRAN/BEEEEI/SPCR agreements	3 agreements	3 agreements	100
Support to women	15 women's organizations	106 (credit)	523
Communication plan	0	1 plan	+
Environmental impact monitoring plan	1 plan	1 plan	100
<b>• Project Unit</b>			
Project head-office building	1 building	1 building	100
External audit	5 fiscal yrs	5 + 1.5 fiscal yrs	100
Mid-term review	1 review	1 review	100
Final evaluation	0	1 final evaluation	+



## REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)****COMPLETION REPORT****Project Disbursements**

- Schedule of PMET Expenditure from ADF Funds (in UA million)

Years	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Estimate	1.20	2.90	3.01	0.36	0.44	-	-	-	-	7.95
Actual	Suspension	suspension	0.41	0.91	2.47	1.51	1.67	0.73	0.25	7.95
% Disbursed (total)	0	0	5.5	16.6	47.7	66.7	87.7	96.9	100.0	

- ADF Expenditure by Category (UA million)

Code	Category	Amount at Appraisal	Final revised Amount	2001	2002	2003	2004	2005	2006	2007
1	Goods	0.26	0.33	0.16	0.04	0.02	0.03	0.02	0.01	0.0
2	Works	3.67	4.56	0.01	0.23	1.64	0.99	1.17	0.36	0.11
3	Services	2.15	2.06	0.16	0.43	0.42	0.49	0.35	0.21	0.07
4	Operating costs	0.10	0.26	0.03	0.04	0.05	0.05	0.05	0.04	0.00
5	Personnel	0.20	0.54	0.04	0.08	0.08	0.09	0.10	0.13	0.03
6	Guarantee fund	0.18	0.19	-	0.19	-	-	-	-	-
7	Non-allocated	1.39	0.00							
	Total	7.95	7.95	0.40	1.00	2.22	1.66	1.68	0.76	0.22

REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)**

**COMPLETION REPORT**

**Evaluation of Economic Rate of Return (ERR)**

**Area and Production by Developed Site**

Crops per Site	With Project Situation			Situation without Development (No Project) for Land Commanded by Water					
	Developed Areas (ha)	Yield (kg/ha)	Production (Tonnes)	Off-Season		Rainy Season			
				Assumption on % Area Developed *	Additional Off-Season Area related to Project	Millet Production Lost following formation of Reservoirs			
						Area (kg/ha)	Yield (kg/ha)	Production (tonnes)	Value (CFAF)
<b>ADOUNA</b>									
Tomato	146.28	1 640	240	50%	73				
Sweet potato	73.79	30 640	2 261	50%	37				
Onion	24.615	116 236	2 861	50%	12				
Cowpea	34.807	658	23	50%	17				
Total area developed	279.492					0	350	0	0
<b>LILANGO</b>									
Tomato	58.538	630	37	0%	59				
Sweet potato	55.322	17 015	941	0%	55				
Onion	12.888	81 812	1 054	0%	13				
Cowpea	83.59	1 093	91	0%	84				
Irish potato	3.422	18 566	64	0%	3				
Total area developed	213.76					200	350	70	4 200 000
<b>MINAO</b>									
Tomato	72.761	630	46	0%	73	85	350	30	1 785 000

ALIBOU									
Tomato	65.706	389	26	2%	64				
Sweet potato	6.74	13 067	88	2%	7				
Onion	1.257	48 895	61	2%	1				
Cowpea	12.691	225	3	2%	12				
Total area developed	86.394					65	350	23	1 365 000
KOUNKOUZOUT/BAGAYE									
Tomato	25.462	850	22	0%	25				
Sweet potato	16.14	9760	158	0%	16				
Onion	1.91	51 523	98	0%	2				
Cowpea	1.725	375	0.6	0%	2				
Total area developed	45.237					30	350	11	630 000
KARADJI NORD									
Tomato	62.098	587	36	20%	50				
Sweet potato	-	-	-	-	-				
Onion	-	-	-	-	-				
Cowpea	91.343	937	86	20%	73				
Total area developed	153.441					40	350	14	840 000
GOUNFARA									
Tomato									
Sweet potato									
Onion	6.64	66 301	440	0%	7				
Cowpea	17.11	658	11	0%	11				
Total area developed	23.75					50	350	18	1 050 000
All Structures	874.835				697				
					Total Millet before Project	470	-	165	9 870 000

Economic and Financial Calculations for Water Harnessing Structures

Crops	Economic Data on the 2005/2006 Off-Season (source PMET)								
	Area (ha)	Average Yield (kg/ha)	Production (tonnes)	Price per Tonne	Production Value (CFAF)	Production Costs		Gross Margin	
						CFAF/ha	CFAF	CFAF	CFAF/ha
Dried Tomato	430.845	945	407	312 500	127 187 500	133 180	57 379 939	69 807 561	162 025
Sweet Potato	151.992	22 685	3 448	90 000	310 320 000	170 000	25 838 640	284 481 360	1 871 686
Onion	47.31	95 413	4 514	60 000	270 840 000	1 440 000	68 126 400	202 713 600	4 284 794
Cowpea seeds	241.266	891	215	130 000	27 950 000	8 575	2 068 856	25 881 144	107 272
Irish Potato	3.422	18 703	64	200 000	12 800 000	1 800 000	6 159 600	6 640 400	1 940 503
Total	874.835	-			749 097 500		159 573 435	589 524 065	673 869
Crops	Additional Values with Project								
	Area (ha)	Production (t)	Production Value (CFAF)	Production Costs (CFAF)	Gross Margin (CFAF)				
Dried tomato	344	325	101 541 963	45 810 097	55 731 867				
Sweet potato	115	2 608	234 716 761	19 543 574	215 173 187				
Onion	35	3 337	200 238 178	50 367 398	149 870 779				
Cowpea seeds	199	178	23 080 255	1 708 398	21 371 857				
Irish potato	3	64	12 800 000	6 159 600	6 640 400				
Total	697		572 377 156	123 589 067	448 788 089				

Calculation of IRR

Consideration of new water harnessing structures (875 ha taken into consideration), new SWC/SPR improvements (8,871 ha) and intensification of rain-fed cropping excluding structures and improvements (estimated 8,000 ha)

Year	1	2	3	4	5	6	7	8	9	10
Financial Flows (CFAF)	-4 225 569 370	606 958 889	626 158 889	664 558 889	732 958 889	791 358 889	829 758 889	829 758 889	829 758 889	829 758 889
Year	11	12	13	14	15	16	17	18	19	20
Financial Flows (CFAF)	259 745 744	259 745 745	259 745 746	259 745 747	259 745 748	386 334 816	386 334 817	386 334 818	386 334 819	386 334 820
Year	21	22	23	24	25					
Financial Flows (CFAF)	475 044 800	475 044 800	475 044 800	475 044 800	475 044 800					
<b>IRR</b> (Structures + SWC/SPR + rain-fed)	<b>13.1%</b>									

- Considering water harnessing structures only, IRR is estimated at **6.8%**
- Considering SWC/SPR improvements only, IRR is estimated at **18.9%**
- Considering intense rain-fed cropping only (excluding structures and improvements), IRR is estimated at **34.2%**

REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)**

**COMPLETION REPORT**

**List of Major Contracts**

**GOODS**

<b><i>CONTRACT NUMBERS</i></b>	<b><i>BENEFICIARIES</i></b>	<b><i>DESCRIPTION</i></b>	<b><i>AMOUNT IN CFAF</i></b>	<b><i>Procurement Method Envisaged</i></b>	<b><i>Procurement Method Used</i></b>
5000009342	CFAO NIGER	Supply of 7 vehicles	121 400 000	LS	LS
5000009337/38	BUROPA	Supply of office equipment	18 805 970	LS	LS
5000009339	TOUTELEC NIGER	Supply of IT equipment	11 536 150	LS	LS
5000014652	CFAO NIGER	Supply of 1 vehicle and 3 motorcycles	23 750 000	LS	LS
RF	CHEFFOU ABOUBACAR	Supply of millet for SWC/SPR works	26 500 000	NCB	NCB

SERVICES

<b>CONTRACT NUMBERS</b>	<b>BENEFICIARIES</b>	<b>DESCRIPTION</b>	<b>AMOUNT IN CFAF</b>	<b>Procurement Method Envisaged</b>	<b>Procurement Method Used</b>
5000009333	LOUIS BERGER INC USA	Preparation of detailed designs/BD	215 564 040	SL	SL
5000009337	LAMCO ENGINEERING FIRM	Studies and control of access road rehab works	71 825 000	SL	SL
5000009336	BUREAU NIGERIEEN D'INGENIERIE ET CONSEILS	Preparation of extension and training plan and programme	10 224 500	SL	SL
5000009335	BUREAU NIGERIEEN D'INGENIERIE ET CONSEILS	Preparation of monitoring-evaluation system	6 149 000	SL	SL
5000009334	SOFRECO	RE Technical Assistance	163 800 000	SL	SL
5000009343	RURAL CODE PERMANENT SECRETARIAT	Establishment of 2 COFOs at Tahoua and Konni	103 450 000	Direct Contract	Direct Contract
5000009344	ENVIRONMENTAL AND IMPACT ASSESSMENT BUREAU	Environmental and Epidemiological monitoring	169 200 000	Direct Contract	Direct Contract
5000009345	KOKARI SICR	Management of guarantee funds	92 414 458	Direct Contract	Direct Contract
5000014085	CEH-SIDI CONSULTING FIRM	Recruitment of DPO for hydraulic infrastructure	100 640 004	SL	SL
5000014103	SONIBANK	Establishment of guarantee fund	180 000 000	Direct Contract	Direct Contract
RF	ABC ECOLOGIE	Implementation of extension and training programme	272 221 154	SL	SL
5000014805	DELOITE & TOUCHE	Auditing of 2001 to 2003 accounts	28 747 500	SL	SL
5000014969	TECHNI-CONSULT	Study and monitoring of <i>kori</i> banks protection works	40 156 574	SL	SL
RF	I N R A N	Implementation of research & development	148 799 195	Direct Contract	Direct Contract
5000015355	ERNEST & YOUNG	Supply and installation of accounting software	34 649 160	SL	SL
5000015546	SOGREAH	Control of irrigation infrastructure works	143 241 330	SL	SL
5000016690	DELOITE & TOUCHE	Auditing of 2004 and 2005	19 000 000	SL	SL
5000017190	AGRIFOR	Mid-term review	55 605 030	SL	SL
5000018345	BETICO MALI	Control of Kounkouzout-Adouna irrigation infrastructure works	46 560 000	SL	SL
5000018346	CEH-SIDI CONSULTING FIRM	Control of well construction works	37 700 000	SL	SL
5000020381	AGRER-BNIC Group	Final project evaluation	36 336 998	SL	SL
5000022178	EFIC Consulting Firm	Auditing of 2006 and 2007 accounts	7 982 000	SL	SL

**WORKS**

<b>CONTRACT NUMBER</b>	<b>BENEFICIARIES</b>	<b>DESCRIPTION</b>	<b>AMOUNT IN CFAF</b>	<b>Procurement Method Envisaged</b>	<b>Procurement Method Used</b>
5000014968	GROUPEMENT OULD-CHERIF	Rehabilitation of Gounfara track	118 094 744	NCB	NCB
5000014967	T T B	Rehabilitation Karadji track	43 126 438	NCB	NCB
5000014966	ALGHALY MOHAMED	Rehabilitation Kounkouzout track	66 604 263	NCB	NCB
RF	YAHAYA Enterprise	Construction of 10 wells at Konni	47 647 962	NCB	NCB
RF	E N G E H	Construction of nine wells at Konni	34 775 000	NCB	NCB
RF	YAHAYA Enterprise	Construction of nine wells at Tahoua	49 978 041	NCB	NCB
RF	BEN MOUSSA	Construction of nine wells at Tahoua	49 960 536	NCB	NCB
RF	MAHAMIDOU YACOUBA Enterprise	Construction of nine wells at Tahoua	42 919 263	NCB	NCB
5000015256	FORACO	Construction one borehole at Gounfara	179 568 000	NCB	NCB
5000015541	IBRAHIM KADA Enterprise	Installation of drinking water supply system at Gounfara	73 470 700	NCB	NCB
5000015542	YAHAYA Enterprise	Installation of drinking water supply system at Bagueye	84 666 725	NCB	NCB
5000015537	OUMADAH BROTHERS	Construction of Lilango dam	270 060 000	ICB	ICB
5000015538	SOBAFOR	Construction of Karadji Nord dam	197 986 387	ICB	ICB
5000015539	GROUPEMENT SGTP/ETI	Construction of Gounfara downstream weir	502 408 636	ICB	ICB
5000015540	SOBAFOR	Construction of Gounfara road dyke	435 262 478	ICB	ICB
5000015534	OUMAROU ANGO ET FRERES Enterprise	Construction of Alibou dam	303 701 374	ICB	ICB
500015536	MOHAMED CHERIF RHALO Enterprise	Construction of Minaou dam	187 030 998	ICB	ICB
5000016682	OULD Enterprise	<i>Kori</i> banks stabilization works	242 602 569	NCB	NCB
RF	MAHAMIDOU YACOUBA Enterprise	Construction of 14 new stores and rehabilitation of 1 store	46 443 788	NCB	NCB
RF	SIG CONSULT	Works for protection of access tracks	34 978 000	NCB	NCB
RF	MAHAMIDOU YACOUBA Enterprise	Construction of 15 wells at Tahoua	70 220 000	NCB	NCB
RF	MAHAMIDOU YACOUBA Enterprise	Construction of 15 wells at Tahoua (contract amendment)	11 540 200		Amendment
RF	GARBA ZADI Enterprise	Construction of 15 wells at Konni	73 867 500	NCB	NCB
5000018341	EGB/TP	Construction of Adouna weir	378 104 576	ICB	ICB
5000018342	OUMADAH BROTHERS	Construction of Kounkouzout weir	246 965 189	ICB	ICB
5000018505	OUMADAH BROTHERS	Transportation of stones for SWC/SPR works	104 114 560	NCB	NCB
RF	GTR Enterprise	Construction of documentation room Rehabilitation of compound	21 062 700	NCB	NCB
RF	OULD Enterprise	Finishing works Bagueye IHC	28 573 920	NCB	NCB



REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)**

COMPLETION REPORT

**Performance Evaluation and Rating**

Implementation Performance

	<i>Component Indicators</i>	<i>Rating (1 to 4)</i>	<i>Remarks</i>
i)	Adherence to implementation schedule	2	One month after loan effectiveness (April 1999), the Bank suspended its disbursements to Niger for nearly 20 months (March 2001). The project's operational phase could only start in April 2001 ending, after 2 extensions, in 30/06/2007, or an effective implementation period of 74 months instead of the projected 60, representing a 23% increase on the project implementation duration.
ii)	Adherence to cost schedule	4	The entire ADF loan was used to finance activities, as initially envisaged. Disbursement of the counterpart funds was generally satisfactory in spite of some delays. At Project end, the contribution of the Government and the population accounted for nearly 14.6% of the total Project amount, or 3.2 percentage points above appraisal (11.4%). The Project also benefited from a WFP 'Food for Work' contribution, which was not projected at appraisal and which amounted to an estimated CFAF 864.66 million.
iii)	Compliance with terms of loan agreement	4	The terms of the loan agreement were complied with: assignment of staff, contribution to financing, credit component agreement, etc.
iv)	Adequacy of monitoring & evaluation and reporting	4	The Project set up a computerized monitoring & evaluation system that allowed the collection and processing of data. The PMU regularly produced quarterly and annual reports that were submitted to ADB, the authorities and national and regional supervisory technical departments.
v)	Satisfactory operations	4	The implementation level of all Project components was excellent. The same applies to its impact although measures must be taken to further consolidate its sustainability.
	Total	18/20	
	Overall assessment of implementation performance	3.6	The Project's implementation performance is highly satisfactory

Bank Performance

No.	<i>Component Indicators</i>	<i>Rating (1 to 4)</i>	<i>Remarks</i>
i)	At identification	3	The Project, identified in 1990, was in keeping with the Bank's strategy and that of the Government for whom the agro-silvo-pastoral constituted a pillar for the economic and social development of Niger.
ii)	At preparation	3	The feasibility study was prepared in 1992 with financing from the Bank, by the Louis Berger International Firm. It covered the harnessing of surface run-off water in the Tahoua, Zinder and Agadez Departments.
iii)	At appraisal	4	The Appraisal Report was of good quality and successfully covered the technical, economic, financial, social and environmental aspects linked to such a project. The capacity building needs of the actors involved were correctly addressed through the use of the participatory approach.
iv)	At supervision	3	The Bank regularly supervised the Project and fielded 11 missions. They helped to resolve problems that could have delayed implementation.
	Total	13/16	
	Overall assessment of Bank performance	3.25	The Bank's performance is highly satisfactory

Project Outcomes

<i>No.</i>	<i>Component Indicators</i>	<i>Rating (1 to 4)</i>	<i>Remarks</i>
1.	<i>Relevance and Achievement of Objectives</i>		
i)	Macro-economic policy	4	The Project is fully consistent with the Poverty Reduction Strategy (2002) and the Rural Development Strategy adopted by the Government after the signing of the loan agreement.
ii)	Sector policy	4	The Project is a major tool in the implementation of the Rural Development Strategy, which aims among others to improve food security and ensure the sustainable management of natural resources to safeguard the living conditions of the population.
iii)	Physical outputs	4	The physical outputs of the Project were largely attained, and several were even largely exceeded.
iv)	Financial component	4	The final project cost in UA corresponds to that of the appraisal estimates. Added to this is the cost of the food supplies provided by WFP as part of the 'food for work'
v)	Poverty reduction, social impact and gender	4	The Project had a very positive impact on poverty reduction (cash injections, access to credit, positive cereal balance and increased animal production), the promotion of women's status, reduction of rural exodus and support to grassroots development dynamics.
vi)	Environment	4	Positive effects linked to SWC/SPR improvements, weirs and dams through the curbing of erosion caused by run-off water. The implementation of the ESMP translated into several training programmes for the technical departments and the population, as well as supplementary studies on the prevalence of water-borne diseases and inventory of certain plants
vii)	Private sector development	3	The construction of weirs and dams helped provide more employment for the rural communities and extend the work time for the population concerned throughout the year. This creation of employment and increased revenue resulted in a significant reduction in the rural exodus prevalent in the region. The Project also improved access to several remote villages and allowed their integration into economic channels as well as enabled the development of community-based credit (1 MFI).

Project Outcomes

<i>No.</i>	<i>Components of Indicators</i>	<i>Score (1 to 4)</i>	<i>Remarks</i>
2.	<i>Institutional Strengthening</i>		
i)	Institutional framework	4	The Project contributed fully to institutional strengthening through the agreements signed with the following institutions that operated in the region: (i) INRAN for research & development; (ii) SICR/KOKARI for establishment of the credit scheme; (iii) BEEEI for environmental monitoring, and (iv) SP/CNCR, which provided support for the setting up and operation of the Tahoua and Konni COFOs. The Project also assisted with the emergence of 217 producers' organizations (POs), 6 PO Unions, 7 market garden cooperatives, 16 input shop management committees, or a total of 246 producers' bodies.
ii)	Financial and integrated management systems, including audit systems	3	The Project did not encounter any financial management problems. Financial audits regularly indicated that Project was being managed in conformity with the Bank's administrative and accounting procedures. The 2005 audit showed however that the last quarter tranche of the national budget was not paid, currently putting the Project in arrears to 4 contractors.
iii)	Technology transfer	3	The water harnessing structures and mini-DWS constructed by the Project are simple and can easily be maintained by the beneficiaries. They appear reliable after three years of full use. These technologies are worth generalizing for similar use in the country.
iv)	Staffing by qualified persons (including turnover), training and counterpart staff	4	The commendable professionalism and commitment of the PMET Director and the various experts, as well as the effective support of the administrative authorities contributed significantly to the achievement of the Project's outcomes. The team received efficient technical assistance support for three years. The PMU members, technical departments and various actors benefited from training.

Project Outcomes

<i>No.</i>	<i>Component Indicators</i>	<i>Rating (1 to 4)</i>	<i>Remarks</i>
3.	<i>Sustainability</i>		
i)	Continued Borrower commitment	3	The Borrower maintains its resolve to pursue, with the help of its partners, the implementation of a decentralized and sustainable natural resource management policy. However, the PMET completion mission observed insufficient monitoring of the Project's outputs and supervision of the beneficiaries
ii)	Environmental policy	3	The Borrower is highly aware of environmental issues; and a regional environmental surveillance and monitoring unit was established at Tahoua in 2003. This unit however needs to be resourced to remain operational.
iii)	Institutional framework	4	The Project was integrated into the administration's organization chart. Other similar projects were initiated in the country and benefit from the existing institutional framework.
iv)	Technical viability and staffing	4	The structures built are operational, with a life-span of more than 30 years and requiring limited maintenance. Trained management committees have been established.
v)	Financial viability including cost recovery systems	3	The irrigation facilities allowed off-season cropping on nearly 1 000 ha and land reclaiming works covered 8 871 ha. The Project thus created employment, settled the population and generated increased annual revenue, estimated at CFAF 572 million.
vi)	Economic viability	4	The Project is economically viable. It resulted in increased cereal production, monetary incomes, improved water supply for more than 33 000 people, improved access to primary health care, improved access to villages, better environmental protection and improved living conditions for women, mainly through credit.
vii)	Environmental viability	4	PMET contributed to the concrete implementation in the Tahoua region of national policies on environmental impact assessment and monitoring. No major negative impact has been caused by PMET.
viii)	O&M facilitation (availability of recurrent funding, foreign exchange, spare parts, etc.)	3	The management committees for the structures have been established, trained and have bank accounts. The committees for drinking water supply and health huts are operational, unlike those for the retention structures, which need to be monitored.
ix)	Economic Internal Rate of Return	3	The internal rate of return is estimated at 13.1% (6.8% for water harnessing structures and 18.9% the SWC/SPR improvements), without taking into account the increased animal production and certain credit activities
	TOTAL	72/80	
	<b>Overall Assessment of Outcomes</b>	<b>3.6</b>	<b>The overall assessment of the Project is highly satisfactory</b>

REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)**

**COMPLETION REPORT**

**Matrix of Recommendations and Follow-Up Measures**

<b>MAIN FINDINGS AND CONCLUSIONS</b>	<b>LESSONS LEARNT/RECOMMENDATIONS</b>	<b>FOLLOW-UP ACTIONS</b>	<b>RESPONSIBILITY</b>
<p><b>Project Formulation and Rationale</b> <i>The Project is consistent with the Rural Development Strategy of the Government aimed, among others, at improved food security and the sustainable management of natural resources</i></p>	<p>The design was realistic, focused on a priority area of intervention: water harnessing. The formulation and rationale were good and are still relevant. Consider this type of design for other rural development operations in Niger.</p>	<p>Capitalize on and disseminate PMET design approach and results.</p>	<p>ADB/Government</p>
<p><b>Project Implementation</b> <i>The Project was well implemented</i></p>	<p>The Project Team successfully harmonized the interventions of the Bank, the administrative and technical authorities and the beneficiaries; it also handled procurement and the monitoring of activities efficiently. The quality of human resources is an essential factor in the proper implementation of a project.</p>	<p>Ensure, for future projects, the putting together of a competent, efficient and committed coordinating team, with the requisite technical expertise in the relevant fields, and experienced in project requirements (procurement, management, monitoring-evaluation, etc.).</p>	<p>ADB/Government</p>
<p><b>Compliance with covenants and loan conditions</b> <i>The loan conditions were relatively simple to meet and did not delay Project start-up</i></p>	<p>The prompt fulfilment of the conditions precedent contributed to compliance with the timetable. The conditions must be extensively discussed during project appraisal. A monitoring mechanism should help to speed up fulfilment of the conditions.</p>	<p>Ensure that, for future projects, the conditions precedent are realistic and that they are followed up for compliance immediately upon approval of the project.</p>	<p>ADB/Government</p>

<p><b>Performance Evaluation and Project Outcomes</b></p> <p><i>The Project outcomes appear highly satisfactory, at completion. PMET turned out to be highly successful. In its area of intervention, the PMET made significant progress in attaining its objectives of poverty reduction and improved living conditions for the population, particularly in terms of improved food security.</i></p>	<p>The Project was relevant and was able to obtain the complete support of the beneficiaries. The PMET's success lies in a number of pillars, including mainly: the implementation of simple technical solutions to essential problems, the systematic application of a participatory approach and the development of partnerships, the involvement of stakeholders, the calibre of the PMU, the time invested in implementation and support, as well as the Bank's responsiveness.</p> <p>The various contributing factors to the PMET's success must be analyzed and disseminated, particularly the credit component. The overall weak capacity of national enterprises calls for specific support at the national level.</p>	<p>Ensure extensive dissemination of the good results obtained by PMET, and fully capitalize and build on the successes achieved through the Project's interventions.</p> <p>Take into account PMET's successful experience in rural credit, and compare it to other credit financing mechanisms supported by the Bank, in order to determine the extent and manner in which the experience could be customized, developed and reproduced.</p> <p>In view of the needs expressed and the potential of the region for the harnessing of water resources and for improved access to remote areas, envisage a study for a second phase in order to further spread the Project's successes.</p> <p>Examine ways and means of contributing to strengthening and equipping small and medium-scale enterprises.</p>	<p>ADB (OSAN, COMU, OPEV)</p> <p>ADB/Government</p> <p>Government/ADB</p> <p>Government/ADB</p>
<p><b>Sustainability</b></p> <p>The structures were put up in conformity with the required technical standards and are operational. They constitute a guarantee for a degree of sustainability.</p>	<p>The technical quality of the infrastructure constitutes an essential, but insufficient pre-requisite. Management committees have been set up and trained, but they are not yet completely viable. It is important to continue providing support for these facilities.</p>	<p>Continue to provide in the field, through the relevant technical departments, the monitoring of the PMET's activities and support to producers so as to maintain the momentum set in motion and boost the sustainability of the various actions initiated by PMET.</p>	<p>Government</p>

REPUBLIC OF NIGER

**TAHOUA REGION WATER HARNESSING PROJECT (PMET)**

COMPLETION REPORT

**Sources of Information**

- 1 Run-off Surface Water Harnessing Study in the Tahoua, Zinder and Agadez Regions - Phase II. Feasibility Study. Final Report.  
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- 3 Loan Agreement between the Republic of Niger and the African Development Fund (Tahoua Department Water Harnessing Project). (14 p.).  
N°F/NIG/MOB-EU/98/23 of 12 November 1998.
- 4 Action Plan for Extension/Training in the Tahoua Water Harnessing Project Area. Final Report (34 p). Republic of Niger. Ministry of Rural Development. Department of Rural Agriculture Development and Equipment. PMU. ADF. BNI C/SCP Financing. July 2001.
- 5 Preparation of the monitoring-evaluation system of the Tahoua Water Harnessing Project. Final Report (64 p). Republic of Niger. Ministry of Rural Development. Department of Rural Agriculture Development and Equipment. PMU. November 2001.
- 6 Poverty Reduction Strategy. Complete PRS, prepared by the Government of Niger (209 p). Niger against poverty. Republic of Niger.  
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- 7 INRAN-PMET collaboration agreement. Provisional PMET Research-Development Activity Programme (28 p). (*INRAN. undated, early 2002*).
- 8 Protocol Agreement n°2002-03/PMET. Agreement between PMET and INRAN for the implementation of the Research-Development sub-component. (9p). Duration: 3 years. Republic of Niger. Ministry of Agricultural Development, INRAN/PMET. August 2002.



- 9 Audit reports for 2002, 2003 and 2005 of the Tahoua Water Harnessing Project (PMET) Close of fiscal year 31 December 2001. (Deloitte & Touche – Burkina)
- 10 Environmental Impact Assessment of the Tahoua Department Water Harnessing Project (PMET) (71 p+ Annexes). Republic of Niger. Ministry of Agricultural Development. Department of Rural Agriculture Development and Equipment. Tahoua Department Water Harnessing Project, 2003  
(This document includes the ESMP).
- 11 Mapping of five watersheds of the Tahoua Department Water Harnessing Project. Final Report ( ). Republic of Niger. Ministry of Water Resources, the Environment and Desertification Control. Department of Environment. Technical Support Section (UTA/DE). February 2004.
- 12 Mid-term Review Report. Republic of Niger. Ministry of Agricultural Development. Department of Rural Agriculture Development and Equipment. Tahoua Department Water Harnessing Project (PMET). AGRIFOR, July 2004.
- 13 Quarterly activity reports, 2001 to 2007.
- 14 PMET annual activity reports: 2001to 2006.
- 15 Supervision mission reports of ADB, MDA and the Regional Monitoring Committee.
- 16 Final evaluation report of the Tahoua Department Water Harnessing Project. AGRER/BNIC Group, October 2006.
- 17 PMET completion report.  
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