AFRICAN DEVELOPMENT FUND

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APPRAISAL REPORT

FIRE WOOD PROJECT – PHASE II (PBF-II)

REPUBLIC OF BENIN

COUNTRY DEPARTMENT
WEST REGION

OCDW
JULY 2001

SCCD : N.G.

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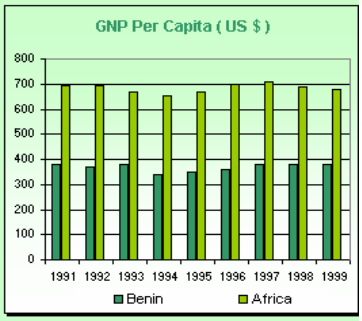
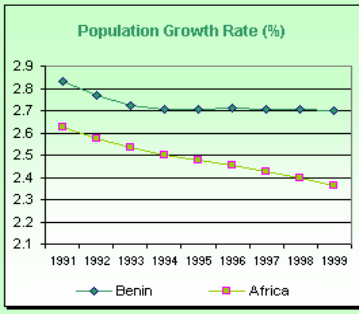
This report was prepared following a mission to Benin from 25 April to 9 May 2001 by Messrs. G. TIBALDESCHI, Agronomist/Environmentalist, OCDW.4, Head of Mission, M. TRAORE, Environmentalist and Consulting Agro-Economist. For further information, contact Mr. E. DOTE, Ag. Division Manager, OCDW.4 (Ext. 4542).

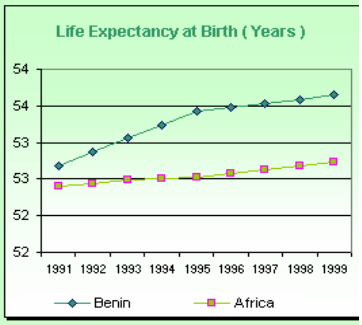
BENIN

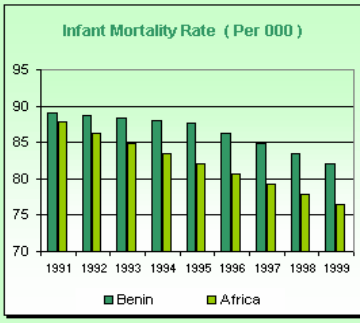
COMPARATIVE SOCIO-ECONOMIC INDICATORS

	Year	Benin	Africa	Developing Countries	Developed Countries
Basic Indicators					
Area ('000 Km²)		113	30,061	80,976	54,658
Total Population (millions)	1999	5.9	765.6	4,793.2	1,185.2
Urban Population (% of Total)	1999	41.6	37.1	39.4	75.8
Population Density (per Km²)	1999	52.7	25.5	59.2	21.7
GNP per Capita (US $)	1999	380	684	1,250	25,890
Labor Force Participation - Total (%)	1999	45.6	43.3	...	...
Labor Force Participation - Female (%)	1999	43.3	35.0	...	...
Gender -Related Development Index Value	1998	0.4	0.483	0.634	0.916
Human Development Index (Rank among 174 countries)	1998	157	n.a.	n.a.	n.a.
Population Living Below $ 1 a Day (% of Population)	1995	...	45.0	32.2	...
Demographic Indicators					
Population Growth Rate - Total (%)	1999	2.7	2.4	1.6	0.3
Population Growth Rate - Urban (%)	1999	4.8	4.5	2.8	0.6
Population < 15 years (%)	1999	46.2	42.7	32.8	18.5
Population >= 65 years (%)	1999	2.8	3.2	5.0	14.0
Dependency Ratio (%)	1999	101.9	86.1	61.0	48.6
Sex Ratio (per 100 female)	1999	97.2	99.4	103.3	94.8
Female Population 15-49 years (millions)	1999	1.3	181.1	151.8	297.2
Life Expectancy at Birth - Total (years)	1999	53.6	52.7	64.3	75.5
Life Expectancy at Birth - Female (years)	1999	55.3	53.5	66.0	79.2
Crude Birth Rate (per 1,000)	1999	40.3	36.3	23.4	10.9
Crude Death Rate (per 1,000)	1999	12.6	13.7	8.4	10.3
Infant Mortality Rate (per 1,000)	1999	82.1	76.4	57.6	8.9
Child Mortality Rate (per 1,000)	1999	119.8	116.6	79.8	10.2
Maternal Mortality Rate (per 100,000)	1990-96	500	698	491	13
Total Fertility Rate (per woman)	1999	5.4	4.8	2.8	1.6
Women Using Contraception (%)	1990-99	16.4	...	56.0	70.0
Health & Nutrition Indicators					
Physicians (per 100,000 people)	1992-97	6	35	78	287
Nurses (per 100,000 people)	1992-97	20	107	98	782
Births attended by Trained Health Personnel (%)	1992-98	60	38	58	99
Access to Safe Water (% of Population)	1992-98	72	58	72	100
Access to Health Services (% of Population)	1992-98	18	64	80	100
Access to Sanitation (% of Population)	1990-97	27	58	44	100
Percentage of Adults (aged 15-49) Living with HIV/AIDS	1997	2.1	5.7	...	...
Incidence of Tuberculosis (per 100,000)	1997	34	201	157	24
Child Immunization Against Tuberculosis (%)	1997	89	72	82	93
Child Immunization Against Measles (%)	1997	82	64	79	90
Underweight Children (% of children under 5 years)	1990-97	29	26	31	...
Daily Calorie Supply	1998	2,571	2,439	2,663	3,380
Public Expenditure on Health (as % of GDP)	1993-98	1.8	2.0	1.8	6.3
Education Indicators					
Gross Enrolment Ratio (%)					
Primary School - Total	1996	78.0	80.0	100.7	102.3
Primary School - Female	1996	58.0	73.4	94.5	101.9
Secondary School - Total	1996	18.3	29.3	50.9	99.5
Secondary School - Female	1996	10.3	25.7	45.8	100.8
Primary School Female Teaching Staff (% of Total)	1990-97	23.1	40.9	51.0	82.0
Adult Illiteracy Rate - Total (%)	1999	61.0	38.8	27.2	1.3
Adult Illiteracy Rate - Male (%)	1999	44.8	30.7	19.5	0.9
Adult Illiteracy Rate - Female (%)	1999	76.3	48.2	35.0	1.7
Percentage of GDP Spent on Education	1990-97	3.2	3.5	3.9	5.9
Environmental Indicators					
Land Use (Arable Land as % of Total Land Area)	1998	15.4	5.9	9.9	11.6
Annual Rate of Deforestation (%)	1990-95	1.2	0.7	0.4	-0.2
Annual Rate of Reforestation (%)	1981-90	5.0	4.0	...	...
Per Capita CO2 Emissions (metric tons)	1996	0.1	1.1	2.1	12.5









Source : Compiled by the Statistics Division from ADB databases; UNAIDS; World Bank Live Database and United Nations Population Division.

Notes: n.a. Not Applicable
... Data Not Available

Last update: May 2001

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PROJECT BRIEF

Date: May 2001

The information given hereunder is intended to provide some guidance to prospective suppliers, contractors, consultants and all persons interested in the procurement of goods and services for projects approved by the Boards of Directors of the Bank Group. More detailed information and guidance may be obtained from the Executing Agency of the Borrower.

1. COUNTRY : BENIN

2. PROJECT NAME : Fire Wood Project – Phase II (PBF-II)

3. LOCATION : Throughout the country

4. BORROWER : Republic of Benin

5. EXECUTING AGENCY : Project management unit in the Directorate of Forestry and Natural Resources (DFRN); Address: BP 393, Cotonou, Benin; Tel.: (+229) 33 06 62; Fax (+ 229) 33 21 92

6. PROJECT

The major project components include:

A. Development of sustainable production;
B. Promotion of energy substitution and saving;
C. Accommodating measures; and
D. Project management.

7. TOTAL COST : UA 11.75 million

- Foreign exchange : UA 5.26 million
- Local currency : UA 6.49 million

8. FINANCING PLAN :

- ADF : UA 10.00 million
- Government : UA 1.75 million

9. APPROVAL DATE : September 2001

10. PROBABLE PROJECT START-UP DATE AND DURATION : January 2002, 5 years

11. PROCUREMENT OF GOODS AND SERVICES

Goods, works and services funded by the ADF will be procured as follows:

i. Competition on the basis of a short list (SL): for the implementation of forestry inventory works and technical assistance; due to the specific nature of forestry inventory works, provision has been made to pre-qualify consulting firms in accordance with Bank procedures;
ii. Local Competition (LC): (i) rehabilitation works on 200 km of rural roads; (ii) implementation of service infrastructure construction works (project headquarters and offices/housing units); (iii) minor and scattered construction works (UVS and schools) will be awarded to SMEs following pre-selection; (iv) borehole works: the country has enough firms to guarantee competition;
iii. Competition on the basis of a short list (SL): for the recruitment of: (i) operators and/or NGOs responsible for organization, sensitization and training, preparation and implementation of an IEC programme; (ii) consulting firms in charge of studies, monitoring and follow-up of feeder road, borehole, UVS and school works; (iii) annual project performance, mid-term review, final evaluation and accounts audit; (iv) consulting firms to prepare SDAs and development plans; (v) research on alternative energy, improved stoves, etc.; (vi) consulting firm responsible for preparing the administration/accounting procedures manual. In view of the minor sums involved, the publication of tender notices will be limited to the local press;
iv. Local shopping: for the procurement of motorcycles, tractor-trailers and flat bed trucks; there are enough local firms to guarantee competition;
v. Other procurement methods: local shopping is justified, given the existence of enough local suppliers and representatives of foreign suppliers to guarantee competitive prices;

- Agreements: shall be signed with specialized agencies and public operators, namely: the ABE for environmental monitoring, INRAB for forestry research and other institutes for energy economy. These agreements will not serve in funding infrastructure or fees but operating expenditure occasioned by their execution;
- goods financed on credit (input, miscellaneous products, artisanal processing equipment, labour, sundry stocks, nurseries, etc.): the beneficiaries will sign contracts based on commercial practices acceptable to the Fund.

12. CONSULTANCY SERVICES REQUIRED

National forestry inventory, enhancement and performance of improved stoves, etc.; project technical assistance; IEC; study and works monitoring; preparation of the procedures manual; accounts audit; annual performance report, mid-term review; final evaluation.

CURRENCY EQUIVALENT

UA 1 = FCFA 935.447 (May 2001)
UA 1 = US $ 1.29579
US $ 1 = CFAF 721.913

WEIGHTS AND MEASUREMENTS

Metric system

FINANCIAL YEAR

1 January - 31 December

LIST OF ANNEXES

ACRONYMS AND ABBREVIATIONS

ABE	:	Benin Environmental Agency (Agence Béninoise pour l'Environnement)
CAA	:	Autonomous Sinking Fund (Caisse d'Amortissement Autonome) (Ministry of Finance)
CARDER	:	Regional Rural Development Action Centre (Centre d'Action Régionale pour le Développement Rural)
DFRN	:	Directorate of Forestry and Natural Resources (Direction des Forêts et des Ressources Naturelles)
DPP	:	Directorate of Programming and Projections (Direction de la Programmation et de la Prospective)
EAP	:	Environmental Action Programme
EU	:	European Union
FECECAM	:	Federation of Agricultural Cooperative Savings and Credit Fund (Fédération des Caisses d'Epargne et de Crédit Agricole Mutuel)
MAEP (ex MDR)	:	Ministry of Agriculture, Livestock and Fisheries
MECCAG-PD	:	State Ministry in charge of Coordination, Government Activity, Projection and Development
MHE	:	Ministry of Housing and Environment
MMEH	:	Ministry of Mines, Energy and Water Resources
MPREPRE	:	Ministry of Planning, Economic Restructuring and Employment Promotion
OPEC	:	Organization of Petroleum Exporting Countries

ACRONYMS AND ABBREVIATIONS (cont'd)

PAMF	:	Agoua, Kouffe Mountains and Wari-Maro Forest Reserve Development Project (Projet d'Aménagement des Massifs Forestiers d'Agoua, Monts Kouffé et Wari Maro)
PBF	:	South Benin Fire Wood Plantation Project (Projet Plantations de Bois de Feu dans le Sud-Bénin)
PGFTR	:	Forest and Surrounding Lands Management Project (Projet de Gestion des Forêts et des Terroirs Riverains)
PGRN	:	Natural Resources Management Project (Projet de Gestion des Ressources Naturelles)
PGTRN	:	Land and Natural Resources Management Project (Projet de Gestion des Terroirs et Ressources Naturelles)
RDPL	:	Rural Development Policy Letter
RPTES	:	Regional Traditional Energy Sectoral Programme
SDA	:	Supply Master Plan (Schéma Directeur d'Approvisionnement)
SIEP	:	Permanent Information and Evaluation System (Système d'Information et d'Evaluation permanente)
UA	:	Unit of Account

EXECUTIVE SUMMARY

1. PROJECT GENESIS AND BACKGROUND

The diminishing forest cover resulting from anthropic pressure and farming systems is a serious threat to Benin's ecological balance. Indeed, in the absence of alternative domestic energy supply sources, 80% of the population cook with firewood and charcoal. Faced with the threat against nature and the ever-increasing fuel wood demand in Southern Benin towns, the Government with ADF and OPEC funding implemented the South Benin Fire Wood Plantations Project (PBF) to cover the fuel wood needs of 28 000 families. The achievements of the PBF Project far exceeded the initial objectives (10 175 ha against the 5 900 ha planned). Hence, there is need to consolidate these achievements and extend the experience to the whole country, with a view to efficiently tapping the remaining forestry resources, on the one hand, and rationalizing the fuel wood sub-sector, on the other hand.

2. LOAN OBJECTIVE

The UA 10 million ADF loan will cover 85% of the total project cost, representing 100% and 76% of the foreign and local currency expenditures, respectively.

3. SECTORAL AND PROJECT OBJECTIVE

The sectoral objective of the project is to reduce poverty through sustainable forestry resources management. The project objective is to improve the supply/demand of fuel wood and promote alternative energy sources.

4. PROJECT ACHIEVEMENTS

The major project achievements include: (i) the national forestry inventory on the basis of which fuel wood supply master plans (schémas directeurs d'approvisionnement, SDAs) for the country's 8 largest towns will be prepared; (ii) establishment of 50 rural markets; (iii) management of 5 000 ha of state forests and 5 000 ha of private forests; (iv) creation of 3 000 ha of private forests and development (enrichment) of 50 000 ha of natural forest reserves; (v) organization of the fuel wood sub-sector; (vii) support for the private sector with regard to fuel wood substitution, production and distribution of improved stoves; (viii) rehabilitation of 200 km of access roads; (ix) construction of the project headquarters (Government), 10 offices/housing units, 3 agencies, 9 schools, 9 village health units (VHUs) and drilling of 22 boreholes; (x) establishment of a data bank, creation and organization of a project management unit (PMU).

5. PROJECT COST

The project cost, net of taxes and customs duty, is estimated at FCFA 10,989.92 million (UA 11.75 million), of which FCFA 4,922.84 million (UA 5.26 million) in foreign exchange and FCFA 6,067.08 million (UA 6.49 million) in local currency. The cost was estimated on the basis of second quarter 2001 prices. It includes 5% contingencies on all basic expenditures except staff expenses, technical assistance and services. A 4% provision for inflation was applied to all components.

6. SOURCES OF FINANCE

The ADF and the Government of Benin will jointly finance the project. The ADF will fund 85% of the total project cost (UA 10 million) covering the total foreign exchange cost and 76% of the local currency cost. The Government will contribute FCFA 1,634.64 million (UA 1.75 million) or 15% of total project cost destined for (i) local staff salaries; (ii) vehicle procurement; (iii) construction of the project headquarters; (iv) personal contribution for loans; (v) protected forest development works, labour for social infrastructure and access road maintenance. The beneficiaries will be responsible for (iv) and (v) above.

7. PROJECT IMPLEMENTATION

The Project Management Unit (PMU) set up within the DFRN under the Ministry of Agriculture, Livestock and Fisheries (ex MDR) will be the project executing agency. The UGP will be headed by a Project Manager (PM). The PM will be a top experienced national manager on secondment from the civil service. The PMU will be provided with qualified staff (the number will be limited to the project's key positions). Apart from the PM, the PMU will benefit from the services of national managers that the State will put at its disposal. Such managers will work in close collaboration with technical assistance staff and consultants. Depending on project needs, the PMU will use the services of public and private operators specialized and experienced in their respective fields, notably NGOs, public or private agencies which will be bound by agreements or contracts signed with the PMU. The project management structure will comprise a project operations orientation and follow-up council (conseil d'orientation et de suivi, COS). The implementation phase will span five years, effective from entry into force of the loan agreement.

8. CONCLUSION AND RECOMMENDATIONS

8.1. The Firewood Project – Phase II (PBF-II) is fully in sync with Government development policy, a key objective of which is to protect the environment. In the light of the foregoing, it is recommended to extend to the Republic of Benin a UA 10 million loan from ADF resources, subject to conditions set forth in the loan agreement.

LOGICAL FRAMEWORK

Country: BENIN
Project Name: Fire Wood Project – Phase II (PBF-II)
Project Completion Date: December 2006
Summary Date: June 2001

HIERARCHY OF OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	CRITICAL ASSUMPTIONS
SECTORAL OBJECTIVE 1. The sectoral objective of the project is to reduce poverty through sustainable forestry resources management	1.1 Increase of the operators' income by a factor of 2 between year one and year five of the project	1.1. Annual project reports 1.2. Household poverty surveys	
PROJECT OBJECTIVE 1. The specific project objective is to improve the supply/demand status for fuel wood and promote alternative energy sources	1.1. More than 90% of the forestry resources potential known 1.2. Supply master plans prepared for the country's eight largest towns 1.3. Rural fuel wood markets set up and operational; they provide at least 2/3 of supplies to the urban centres 1.4. Vocational associations operational 1.5. Various sub-sector operators sensitized on sustainable forestry resources management	1.1. Result of the national forestry inventory 1.2. Supply master plan 1.3. Forest operation reports 1.4. Progress report on vocational cooperatives set up 1.5. Report of the orientation and follow-up committee 1.6. Development plan implementation reports	1.1. Pressure on forestry resources in deficit areas falls considerably 1.2. Traders in the sub-sector turn their attention to areas with abundant resources 1.3. Surrounding population implement conservation and sustainable forest management measures 1.4. Highly improved partnership between the forestry administration and private operators
ACHIEVEMENTS			
1. Sustainable Production Development a. National forestry inventory compiled b. Supply master plans prepared c. The fuel energy sub-sector organized d. Rural wood markets set up e. State forests and private plantations managed on the basis of a participatory development plan f. Development of protected forests and promotion of village reafforestation	1.1. More than 90% of the potential of the project operating areas known 1.2. Eight (8) master plans drawn up for Abomey-Bohicon, Cotonou, Djougou, Lokossa, Malanville, Natitingou, Parakou and Porto Novo 1.3. Fifty (50) rural markets set up in the country's ten regions by mid-2004 1.4. 100 vocational cooperatives operational (lumberjacks, charcoal makers, transporters, traders) by mid-2004 1.5. Rural fuel wood markets set up and provide nearly 2/3 of supplies to the country's urban centres by 2006	1.1 Forestry inventory report 1.2 Report of consumer survey socio-economic studies 1.3 Report of supply/demand status 1.4 Project implementation reports 1.5 Forestry administration reports (DFRN)	1.1 Schedule for implementation of operations respected 1.2 Deficit zones increasingly subject to less cutting pressure 1.3 Most of the sub-sector operators follow the master plans 1.4 Operators and transporters support the rural wood markets 1.5 Local management structures operational 1.6 Dwellers in the vicinity of forest resources support the principle of participatory development 1.7 Private developers understand the importance of forestry business

HIERARCHY OF OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	CRITICAL ASSUMPTIONS
	1.6. All state and private forests in operation before end 2006 1.7. Uncontrolled cutting in natural formations decline from 2006 1.8. Participatory development plans prepared for protected reserves (50 000 ha) by 2006 1.9. Private reafforestation efforts intensify to cover an area of not less than 3 000 ha in 2006		
2. <u>Promotion of Alternative Energy and Energy Economy</u> Alternative energy sources promoted Improved stoves distributed	2.1. Loans put at the disposal of private promoters throughout the project duration to promote kerosene stoves, solar panels, LPG, etc. 2.2. 10 000 samples of improved stoves distributed to households by 2004 2.3. Equipment loans set up to promote the local production of stoves throughout the project duration	2.1.Project reports on prototype design 2.2.Project progress reports 2.3.Reports of the Directorate of Energy 2.4.Testimonies from women users and extension workers on the performance of specimen stoves	2.1. Energy economy seen as a necessity and accepted by all 2.2. Lumberjacks and charcoal makers adopt wood-saving production methods 2.3. Specimens distributed suit local cooking systems and encounter no cultural resistance 2.4 Lumberjacks and charcoal makers adopt wood-saving production methods
3. <u>Accommodating Measures</u> Regulations reformed and data base set up on energy and the environment Credit fund for women's activities set up Women's activities promoted Workers trained and the people sensitized Research activities supported	3.1. New texts passed not later than 2005 3.2. Effective monitoring of the fuel wood market and regular collection of statistical data throughout the project duration 3.3. At least 50 women cooperatives involved in forestry product operating and development process 3.4. Project and DFRN staff training programme implemented before 2005 3.5. IEC activities benefit at least 300 villages from 2003 (direct contact, Radio, TV, etc.) 3.6. Four institutes/NGOs sign research agreements on various subjects (forest species, sylviculture and agro-forestry, energy economy and carbonization)	3.1. Report of the think-tank on text review 3.2. Reports of the Project Orientation and Follow-up Committee (Comité d'orientation et de suivi, COS) 3.3. Project and DFRN progress reports 3.4. The SIEP team trained and equipped by end 2003 3.5. Reports by institutes and NGOs with which agreements were signed	3.1. Government rapidly sets up a think-tank 3.2. New texts passed 3.3. Women cooperatives support rational natural resources management 3.4. Lumberjacks and charcoal makers adopt wood-saving production methods

HIERARCHY OF OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	CRITICAL ASSUMPTIONS
4. Project Management Equipment procured Technical assistance put in place Staff put in place	4.1. Project staff put in place on the basis of a secondment contract or direct recruitment in 2002 4.2. Project headquarters, the 3 agencies and the 10 offices/housing units built from 2002 4.3. Necessary project equipment procured from 2002 4.4. The CTP recruited and on duty in 2002	4.1. Contracts signed 4.2. Project reports	4.1. Adequate project implementation conditions 4.2. Project resources used wisely
ACTIVITIES Compilation of forestry inventory Implementation of works contracts Conduct of consumer surveys Preparation of supply master plans Preparation of participatory development plans Operation of state-owned and private plantations Training and sensitization Technical assistance Establishment and operation of the project unit Follow-up/evaluation, audit	ADF in UA million Works 1.85 Goods 0.66 Services 2.85 Loans 0.85 Training 0.75 Staff Operations 1.93 Unallocated 1.11 TOTAL 10.00	Various contracts, protocols of agreement, agreements signed Project progress and supervision reports	

1. PROJECT GENESIS AND BACKGROUND

1.1. The diminishing forest cover resulting from anthropic pressure and farming systems is a serious threat to Benin's ecological balance. Indeed, in the absence of alternative domestic energy supply sources, 80% of the population cook with firewood and charcoal. The fuel wood consumed is mostly of natural formation and shrub fallow origin.

1.2. Faced with the threat on natural formations and the unrelenting increase in fuel wood demand in Southern Benin towns, the Government requested and received an ADF loan (with OPEC and WFP joint-financing) to implement the South Benin Fire Wood Plantations Project (PBF) to meet the fuel wood needs of 28 000 families. Project achievements far exceeded the initial set objective of 5 900 ha of plantations. Indeed, the project completion (31 December 1998), saw 10 175 ha of plantations, of which 5 374 in state-owned forests in certain far-deteriorated reserves in the country's south and 4 801 ha of privately-owned rural plantations which received plant supplies and technical support from the PBF. All the plantations are under rapidly growing species and represent a significant resource with very favourable impact on the ecology of areas where they are found.

1.3. Other achievements are related to service and social infrastructure (housing, offices, stores, dispensaries, schools and access roads) built for the use of project participating communities. Overall, the project succeeded at all levels – economic, financial, technical and environmental. At the economic level, the private plantations have contributed largely to meeting the fire and working wood needs. From the technical perspective, the project significantly helped in raising the level of know-how on establishing and running nurseries and plantations, and selling forestry products. Furthermore, the project brought far-reaching support to soil conservation, erosion control, micro-climate restoration, fertility maintenance/increase and promotion.

1.4. Aware of the need for return on these investments and with a view to rationalizing the fuel wood sub-sector, the Government of Benin and the ADF immediately saw the need to pursue the improvement and development of activities undertaken in the forestry sector. The January 1999 workshop on sustaining PBF achievements highlighted the necessity of guaranteeing fire wood supply to the major urban centres and rationalizing its use.

1.5. In order to meet these and several other needs connected with the sustainable management of existing resources, alternative energy promotion and energy savings, the Government of Benin conducted a feasibility study which led to a new wood resources management project that takes into account the rational and sustainable running of plantations set up, and the pursuit of efforts at reafforestation and development of new forests throughout the country as well as development of alternative energy sources.

1.6. Furthermore, the project is founded on Benin's policy choices as expressed in the State Orientation Plan (1998-2002) which emphasizes the development of short and medium-term forestry products through: (i) study of the wood potential trend; (ii) preparation of a rural development programme within a concerted framework; (iii) definition of a fuel wood supply management programme; (iv) forest exploitation promotion and organization, and fuel wood sub-sector promotion.

1.7. This report was prepared in May 2001 based on a feasibility study conducted in November 1999 by the Ministry of Rural Development, the PBF completion report and surveys by the Bank's appraisal mission among the target population, the country's authorities, NGOs and donors resident in Benin.

2. THE AGRICULTURAL SECTOR

2.1. Overview

2.1.1. The agricultural sector is central to Benin's economy. It provides subsistence to 70% of the active population, contributes 39% of the GDP, accounts for 90% of the country's export receipts and 15% of the State income. With nearly 400 000 farms, the sectors is characterized by a profusion of small farms averaging between 0.50 ha in the South to 2 ha in the North.

2.1.2. Farming influences land occupation. Indeed, the farming population predominates at 65.1%, of which 8.3% head farmers. On average, there is one head farmer among 8 active farmers. In sum, farming is Benin's key employer, demonstrating to what extent agriculture is determinant to the national economy, reason for which it needs close attention. However, agricultural development is too dependent on cotton production.

2.2. Rural Development Policy

2.2.1. The first Rural Development Policy Declaration (RDPD) was signed in May 1991 and led to the implementation of the Agricultural Services Restructuring Project (Projet de Restructuration des Services Agricoles, PRSA) a key objective of which was the State's divestiture from certain activities that other sectors could better fulfill. The RDPD re-focused the State's role on its key functions, namely: design, coordination, follow-up and evaluation of development activities. Production (activities of a commercial and private nature) is now the preserve of the private sector.

2.2.2. The objectives assigned the agricultural sector in the 1991 RDPD, re-stated in the 1995 Round Table on the Rural Sector and included in the 1999 Rural Development Policy Declaration (RDPD) aims mostly at: (i) contributing to economic growth, the commercial balance and job creation; (ii) sharing in improving the people's living standard by enhancing farmers' purchasing power, poverty reduction, food quality and safety control; (iii) maintaining food and nutritional security for a rapidly expanding population (3.3% yearly); (iv) sustainably diversifying and intensifying agricultural production, without threatening the productive base and ecological resources.

2.3. Land Use System

2.3.1. In Benin, customary land allocation is practised in the North where the population density is low. In the South, however, land pressure has led to gradual individualization of land use rights. Thus, land ceded becomes the beneficiary's property. Temporary or absolute transfer of landed property from one individual to another takes several forms: individual property, inheritance, donation, purchase, lease, sharecropping, rent. The importance of these transfer methods largely depends on local conditions: demographic pressure, proximity to an urban centre, total land availability. These ownership methods can amplify inequalities or become development constraints since they underlie the under-use of certain lands and the overuse of others. However, where conflict emerges, differences are generally settled effectively through the meeting of persons concerned. Women have no major obstacle to land access and can obtain

loans. They acquire landed property mostly through purchase and inheritance.

2.3.2. Within the project framework and especially in the *Collines* Department and the four Departments of the North, land shortage is not as acute. Farmers have fields averaging 5 to 10 ha. The land use status as described has fewer repercussions on the production system and farm productivity, therefore on forestry resources management.

2.4. Constraints and Possibilities

2.4.1. The agricultural sector faces several constraints that hinder its development, the major ones being: (i) the heavy dependence on the cotton sub-sector which is the only one organized; (ii) the low productivity level; (iii) the considerable pressure on the environment (over-exploitation, bush fire, etc.); (iv) the relatively rapid State divestiture and transfer of responsibility to inadequately prepared operators; and (v) inadequate account taken of women's needs (access to credit and land).

2.4.2. Several possibilities that could attenuate these constraints and boost sectoral growth and development exist. Indeed, the sectoral development potential is vast and varied, and concern: (i) land availability (in the country's central and Northern regions); (ii) development and irrigation possibilities; (iii) the production diversification potential; (iv) the people's dynamism; and (v) the high monetization of the economy.

2.5 Agricultural Development Institutions

2.5.1. The mission of the Ministry of Agriculture, Livestock and Fisheries (MAEP, ex MDR) is to create an enabling environment for national rural development. To fulfill that task, the MAEP at the central level depends on the Cabinet, the Ministry's General Secretariat, the eleven Technical Directorates, and in the field on the following public agencies under its supervision and responsible for policy implementation: the six Regional Rural Development Action Centres (CARDER), the National Institute of Agronomic Research (INRAB), the National Agricultural Promotion Corporation (Société Nationale pour la Promotion Agricole, SONAPRA) which operates in the cotton sub-sector, the National Timber Agency (Office National du Bois, ONAB), the National Food Security Support Agency (Office National d'Appui à la Sécurité Alimentaire, ONASA) for replenishment of the security stock in times of shortage, the National Stabilization Agency (Office National de Stabilisation, ONS) set up in 1996 and mostly in charge of stabilizing prices in the cotton sub-sector.

2.5.2. In addition to these structures are the National Remote Sensing Centre (Centre National de Télédétection, CENATEL) and the National Fauna Reserve Management Centre (Centre National de Gestion des Réserves de Faune, CENAGREF). The Directorate of Operational Training and Extension is in charge of agricultural extension and plays a coordinating role between CADRER, research institutions, farmers' cooperatives and NGOs.

Farmers' Cooperatives

2.5.3. Farmers' cooperatives are found in all agricultural production, processing and marketing activities. Moreover, restructuring exists by gender, sub-sector and at various territorial levels. Hence as at 30 August 1996, the country had 1 064 women's cooperatives, 1 534 village cooperatives, 77 sub-prefectural farmers' unions, 6 departmental unions and 34 rural development cooperatives mostly specialized in oil palm farming. Overall, farmers' cooperatives participate actively in sectoral activities. A chamber of agriculture was set up in

1989 to assist farmers. Regarding forestry, existing associations are few, barely functional and hardly representative of the profession.

NGOs

2.5.4. The democratic dispensation ushered in 1990 with the national conference and the renewed interest of youths in self-employment following the systematic suspension of recruitments into the civil service contributed to the emergence of a large network of national and foreign NGOs in support of the rural sector. The country has nearly 2 000 support NGOs, most of them involved in rural development and the environment.

2.5.5. NGOs active in the forestry and environment sectors basically sensitize the population on reafforestation and the rational use of fuel wood through the distribution of improved stoves. Among such NGOs figure OFEDI, ASED, BENIN 21 and CATWELL. The most effective NGOs will be selected to work with the project. Specific criteria (e.g. experience in sensitization/training, local presence and knowledge of the environment) will be required.

Agricultural Credit

2.5.6 Rural development is a strategic economic sector in Benin and absorbs a significant share of external financing. The micro-credit environment in Benin comprises several operators, namely: a major official network of the Federation of Agricultural Cooperative Savings and Credit Fund (Fédération des Caisses d'Epargne et de Crédit Agricole Mutuel, FECECAM), decentralized financial institutions, specialized credit, micro-finance NGOs and informal structures such as tontine funds and micro-credit associations with membership of 11 000 professionals.

2.5.7 However, the most important endogenous rural financial tool remains the Federation of Agricultural Cooperative Savings and Credit Fund (FECECAM) with a network of 95 local agencies, 43 village agencies, 7 regional unions with 240 000 members of which 67 000 borrowers and FCFA 22 billion in collected deposits (2000). However, FECECAM faces enormous difficulties; the State and donors are in search of alternative solutions with a view to putting in place a more effective credit distribution system.

2.5.8 Other credit networks also operate in Benin, including the rural savings and loans funds (caisses rurales d'épargne et de prêt, CREP) now under the umbrella of the National Federation of Rural Savings and Loans Fund (Fédération Nationale des Caisses Rurales d'Epargne et de Prêt, FENACREP) and self-managed village savings and credit fund (caisses villageoises d'épargne et de crédit autogéré, CAVECA). For now, no national financing structure provides direct funding to the forestry sector. For the project under consideration, credit distribution will be through a cooperative system.

2.6. Performance of Similar Projects

2.6.1. Since it began funding operations in Benin in 1972, the Bank has financed 12 operations in the agricultural sector for UA 91.15 million, of which two in the forestry sector: (i) the South Benin Fire Wood Plantations Project, completed in 1998; and (ii) the Agoua, Kouffe Mountains and Wari-Maro Forest Reserve Development Project (ongoing).

2.6.2. The implementation of the South Benin Firewood Plantations Project (PBF) enabled the Bank to enhance its experience in the forestry sector and draw several useful lessons. Indeed,

the PBF Project largely exceeded the initial objectives. The project promoted the introduction of plant production methods by training nursery operators. In addition, it trained nearly 2 800 independent farmers who set up 4 801 ha of private plantations. The project also permitted the replenishment of timber resources in 5 far-deteriorated State forests (5 374 ha) and contributed to providing those forests with a participatory development plan. Furthermore, the project largely promoted forestry regeneration and timber use methods. It is a fact that forestry development and exploitation methods in the PBF impact area are well known and mastered. The PBF also shared in institution building in terms of field staff training, procurement of means of transport and construction of offices and housing units for field staff. The Government's completion report and the audit reports highlight all project benefits and the smooth conditions under which it was implemented.

2.6.3. Thanks to lessons from that experience, the design of the project under review is more pragmatic and takes into account the multiple facets of participatory and sustainable development in the project impact area. The space and role distribution, especially women's, is founded on experiences drawn from PBF lessons. The expected impact should lead to poverty reduction in the project zone and sustainable forestry resources management.

2.7. Other Donors' Intervention

2.7.1. The core impetus to rural development comes foreign-funded projects. Several donors are involved in Benin's agricultural sector and many projects received foreign assistance, especially the following: (i) the Land and Natural Resources Management Programme (PGTRN) jointly financed by AFD and GTZ in the wake of the PGRN (executed from 1992 to 1998). Under the PGTRN, activities have been proposed to strengthen the population's responsibility in managing natural resources and the rural land plan on six pilot sites; (ii) the Local Food Security Operations Programme (Programme d'Interventions Locales pour la Sécurité Alimentaire, PILSA): jointly financed by the World Bank and Danish Cooperation, the programme aims at strengthening food security in the high-risk prefectures of Comé, Bopa and Dogbo-Tota. The project mostly focuses on promoting activities connected with production, marketing, nutrition education and socio-economic micro-projects; (iii) the Agricultural Sector Development Support Programme (Programme d'Appui au Développement du Secteur Agricole, PADSA), funded by Danish Corporation for five years, starting 1997. PADSA focuses on key agricultural development policy priorities; (iv) the Income Generating Activities Programme (Programme d'Activités Génératrices de Revenus, PAGER): initiated by IFAD in 1995, its purpose is to develop income-generating activities and set up a sustainable rural financing system. It targets cooperatives and uses NGOs to implement its activities.

2.7.2. The project under discussion will strengthen various ongoing activities and help strengthen the people's capacity for sustainable natural resources management, enhance social cohesion through rural wood markets and other organizational structures.

3. THE SUB-SECTORS CONCERNED

3.1. The Forestry Sub-Sector

The Forestry Potential

3.1.1 Benin is not a forested country in the same league with other sub-regional countries such as Cote d'Ivoire and Ghana. However, it is privileged when compared with hinterland countries, especially Niger and Burkina Faso. Resources fall under State reserves, state-protected forests and private forests. State reserves cover nearly 2.7 million ha and comprise 49.57% of forest reserves over an area of 1 338 450 ha; 0.17% of the reafforested area amounting to 4 500 ha; 21.48% of the hunting zones over 503 000 ha. Protected forests cover all other unclassified State forests. Private forests are those belonging to individuals (natural or planted), including sacred forests.

3.1.2. Forestry resources management is essential to covering Benin's immediate fuel wood needs. Overall fuel wood consumption stands at nearly 4 800 000 tonnes/annum. However, the deforestation process has accelerated for many reasons, of which: (i) uncontrolled cutting of working and fire wood and the disappearance of value species; (ii) clearing due to the increasing need for farm land in the wake of demographic pressure; (iii) people moving into reserves to settle; and (iv) overrunning of forests by increasingly large local and foreign herds. As a result, the forest reserves have declined by nearly 67 000 ha (from 1 441 000 ha in 1955 to 1 373 447 ha in 1996), i.e. a loss of 4.7% in four decades.

Legal and Institutional Framework

3.1.3. The land legislation texts that formalize the policy governing Benin's lands and forestry resources include: (i) Edict N° 93-009 of 2 July 1993 establishing the forest system in the Republic of Benin; (ii) Edict N° 96-271 of 2 July 1996 establishing the enforcement modalities for Edict N° 93-009 of 2 July 1993; (iii) Interministerial Order N° 96-008 setting forth the modalities for exporting worked teak and other forest species; and (iv) Order N° 74-26 of 22 March 1974 fixing taxes and fees charged for the issuance of forestry exploitation permits.

3.1.4. Thus the law defines the forest categories (natural, semi-natural, artificial), their tenure (reserve, protected, public and private), forest use rights, modalities for developing and exploiting state-owned forests, etc. Interministerial Order N° 96-008 was issued to strengthen existing laws by banning the export of teak and other forest species in unprocessed form (trunk, hewn, blocks) as well as charcoal. Henceforth, operations are only authorized for sawn timber in the form of planks, friezes and rafters.

3.1.5. Lastly, mention should be made of Edict N° 98-030 of 12 February 1999 on Benin's framework law on the environment which defines the general provisions for protecting and developing the natural environment. The Edict states that the various types of forests (natural, reserve, private) are a national heritage which should be managed, taking into consideration environmental concerns and protected against all forms of deterioration.

3.1.6 Benin's decentralization process impacts on the institutional framework for preparing and implementing forestry programmes. Indeed, Edict 97-029 of 15 January 1999 gives two entities (the departmental consultative and coordination council and the commune [ex sub-prefectures]) forestry development powers. Thus, the departmental consultative and coordination council deliberates on: (i) the territorial development master plan and departmental

development projects; (ii) environmental protection measures; and (iii) forest reserves and hunting zones. Henceforth, it is consulted on all development on communal sites in its territory. In like manner, the commune is responsible for establishing and maintaining plantations, green spaces and any other public facilities aimed at improving the living space. It sees to natural resources protection, especially forests, land, the fauna, water resources and the ground water table, and contributes to their better utilization.

3.1.7 Communes (ex sub-prefectures) are currently the only decentralization level and for that reason, they have a legal personality and are financially autonomous with relatively wide prerogatives to set up and maintain plantations and forests. Thus, the participatory approach holding local governments accountable for natural resources management remains a cornerstone of decentralization; it redefines the relationship between forestry authorities and such localities. The new institutional framework consolidates the forestry policy that the Government initiated in 1994 and which remains a reference tool necessary for sound sustainable natural resources management.

Forest Development and Management

3.1.8. In the face of the unrelenting threat to natural resources, the public authorities have begun to give priority to their rational management. The Government reiterated that priority during the September 1995 rural sector round table. The priority is reflected in several ongoing programmes or actions such as the State Orientation Plan (1998-2002), decentralization edicts, the Environmental Action Plan (EAP), the Natural Forest and Village Reforestation Participatory Development Project for Carbon Reduction, the Forestry Development Priority Action Plan, research and development and the Environmental Management Project of which wood economy is one of the key components. In addition to these projects and actions, there are 13 other operations funded by various donors in the forestry and sustainable development sector (cf. Volume II). None of these projects directly focuses on meeting fuel energy needs.

3.1.9. These actions are somewhat limited by the number and quality of staff. Indeed, following the restructuring of the Directorate of Forestry and Natural Resources (DFRN), the number of senior managers dropped from 72 to 49, although the number of technicians remained unchanged. To make up for the shortfall, all donor-funded projects recruit contractual staff to avoid recurrent costs chargeable to the State.

Forestry Sub-Sectoral Constraints

3.1.10. The major constraints limiting the development of the forestry sub-sector include: (i) the unsuitable institutional framework and lack of a forestry development master plan; (ii) the absence of planning and inadequate development action; (iii) staff shortage and quality; (iv) lack of consultation with the people and their involvement; (v) inadequate resources to attain the physical objectives; and (vi) inadequate consultation between various structures.

3.2. Other Energy Sub-Sectors

3.2.1. The family energy sub-sector is highly dependent on fuel wood (80%) and is characterized by the absence of coordination of policies and planning in the traditional energy, electricity and oil sub-sectors. To meet the country's energy needs, the sector is organized as follows: (i) the DFRN manages the traditional energy sub-sector, the informal sector and NGOs; (ii) the Directorate of Energy (DEN) manages the hydrocarbons sub-sector, the Seme Oil Project (Projet Pétrolier de Sèmè, PPS), the National Petroleum Products Marketing Corporation (Société Nationale de Commercialisation des Produits Pétroliers, SONACOP), the private sector and the informal sector;

(iii) DEN manages the electricity sub-sector, the Benin Electricity Corporation (Compagnie Electrique du Bénin, CEB), the Directorate of Water Resources (Direction de l'Hydraulique, DH), the Benin Water and Electricity Corporation (Société Béninoise d'Eau et d'Electricité, SBEE) and other independent producers. Hence, the energy sector is shared by the Ministry of Mines, Energy and Water Resources (MMEH), the Ministry of Commerce, Industry and Employment Promotion, the MAEP, the private sector, NGOs and the informal sector.

3.2.2. The renewable energy sector is barely developed in Benin. In a bid to bring electricity to distant villages which for various reasons cannot be connected to the conventional network, Benin has for many years experimented with renewable energy, putting emphasis on the development of photo-voltaic solar energy, micro hydro-electric stations, bio-gas and wind energy.

4. THE PROJECT

4.1. Design and Rationale

4.1.1. The Fire Wood Project – Phase II is based on the achievements of the South Benin Fire Wood Plantations Project (PBF) which cultivated 10 175 ha of fire wood plantations to make fuel wood available to consumers. Indeed, all State plantations cultivated (5 374 ha) have matured and most have exceeded the replacement age. It is indispensable to harvest the trees in order to regenerate them and develop permanent timber capital. Furthermore, the cultivation of private plantations (4 801 ha) raised considerable interest among the people which should be tapped when cultivating other plantations, given the high demand for wood energy.

4.1.2. Furthermore, the project draws its rationale from Government's energy objectives as stated in the State Orientation Plan (1998-2002) which underscores short- and medium-term forestry product development through preparation of supply master plans (schémas directeurs d'approvisionnement, SDA), rural space development, adaptation of texts and human resources training. It also emphasizes sustainable wood resources management (the main factor limiting the coverage of wood energy needs). It responds to Government commitments made within the Framework Agreement on Climatic Change, the Agreement on Biological Diversity, the Agreement on Desert Control and the General Agreement on Forests.

4.1.3. The project falls within the framework of Government's key policy thrusts especially with regard to poverty control, women's involvement in development, sustainable protection of ecosystems and decentralization. The policy engenders a new approach to relations between the forestry administration and local governments.

4.1.4. The participatory approach aimed at making local governments accountable for natural resources management remains a corner stone of the ongoing decentralization policy. The development and sustainable exploitation of forests under the project being discussed is the responsibility of the surrounding population and the administration, based on a participatory development plan concluded between the parties within the rural wood market (marchés ruraux de bois, MRB) creation framework. The project design approach consists in considering the forest as a "business" to be managed sustainably while respecting the existing eco-system and without reducing its capital. The people will participate in all phases of preparation and implementation of the projected development and supply master plans (SDAs) with a view to concretizing the combined will of the Government and the people to promote the participatory approach to sustainable development. All the activities and accommodating measures make the project a means for implementing the national poverty reduction strategy which, among other

things, aims at improving and consolidating economic growth and reducing the number of families living in extreme poverty.

4.2. Project Zone and Beneficiaries

4.2.1. The project zone will cover all of the country's departments. In the South in which the PBF project was implemented, the climate is Guinean with annual rainfall ranging from 1 300 mm to 1 400 mm. The central region of the country has a Sudano-Guinean climate with rainfall in the 1000 – 1 300 mm bracket. In contrast, the North has a Sudan - Guinean / Sudanian climate with rainfall of between 800 to 1 000 mm. The road network largely comprises untarred access roads and is hardly motorable during the rainy season. Regarding health, the system is based on the Communal Health Centres (Centres Communaux de Santé, CCS) and Sub-Prefectural Health Centres (Centres de Santé de Sous-Préfectures, CSSP). However, people who live far from such centres in no way benefit from their services. The same obtains for the education system which should move closer to the people.

4.2.2. Project beneficiaries belong to several social categories and are active in all fields of endeavour in the fuel wood sub-sector. Although heavily involved in economic activities, most of the beneficiaries live in extreme poverty (HDI = 0.421 in 1999). The project targets the following beneficiaries: (i) forestry operators (lumberjacks, charcoal makers); (ii) rural dwellers and private plantation owners; (iii) sub-sector professionals (timber, stove and alternative source sellers, transporters); (iv) the forestry administration; (v) consumers; (vi) rural women and women fuel wood sellers. Each profession is organized into cooperatives that can play an active role in the project.

4.3. Strategic Context

4.3.1. The project falls within the framework of Benin's development policy and its actions are set forth in the State Orientation Plan for the 1998 - 2002 period. It takes into account the strengths and weaknesses of previous projects and programmes and lays emphasis on the participatory approach and capacity building of various actors involved in managing the wood energy sub-sector. It will contribute to preparing and implementing a national energy policy and a consistent wood sub-sector programme in view of the urgent need to execute activities to slow down and control anthropic pressure on forestry resources.

4.3.2. The activities planned comply with the national energy policy, the traditional energy sectoral programme (programme régional du secteur des énergies traditionnelles, RPTES), the national environmental policy, the rural development policy declaration as well as the rural development master plan, its strategic and operational plan. The project activities are also in sync with national and donor strategies which emphasize poverty reduction, energy control and sustainable development. The project contributes to attaining the poverty reduction objective, is in line with national sectoral priorities and strategies and capable of generating significant value added by inducing only minimal recurrent expenditure.

4.3.3. The practical modalities for implementing the project under discussion draws from similar projects implemented in the country, especially the Bank's experience from the South Benin Firewood Plantations Project (PBF). That project contributed significantly to meeting fire wood needs (10 175 ha cultivated), in addition to other achievements in connection with service and social infrastructure (offices/housing units, stores, dispensaries, schools, access roads, training centres, etc.). All such achievements benefitted the communities in the project zone. Overall, the project performed at all levels – economic, financial, technical and environmental. At the

economic level, the plantations generated nearly 1 500 jobs. At the technical front, the project helped to significantly lift the level of know-how on establishment and management of nurseries, plantations and sale of forestry products by the neighbouring community. Furthermore, it contributed largely to soil conservation, erosion control, micro-climate restoration and increase of soil fertility. Moreover, the PBF project trained competent managers and set up local expertise able to design and successfully implement similar projects. Thus at the end of the PBF project, the Government with ADF backing initiated the Agoua, Kouffe Mountains and Wari-Maro Forest Reserve Development Project (PAMF) jointly funded by the ADF and ABEDA, the core objective of which is to preserve and sustainably manage natural eco-systems.

4.3.4. The PBF experience provided the foundation for the strategy for implementing the project under discussion. Indeed, the PBF manager was appointed, with the Bank's consent, to implement the PAMF project, thus ensuring continuity in handling forestry resources management. While awaiting the implementation of the current project in pursuit of PBF actions with regard to reafforestation and satisfaction of fuel wood needs, the forestry heritage set up by the PBF was handed over to the DFRN. That heritage will be transferred to the people for management (organized into rural wood markets, MRB). Indeed, the MRBs involve the creation of a consensus structure bringing together various timber vocational associations and comprising timber exploitation zones and sales points. The MRBs will be tied to the administration by a contract determining the conditions for transferring responsibility for operating and marketing fuel wood. The establishment of the MRBs will enable people so regrouped in the zone to identify with the project objectives and improve their negotiating powers vis-à-vis wood energy transport and marketing professionals.

4.4. Project Objectives

Sectoral Objective

4.4.1. The project's sectoral objective is to reduce poverty through sustainable forestry resources management.

Project Objective

4.4.2. The project objective is to improve the demand/supply of fuel wood and promote alternative energy sources.

4.5. Project Description

4.5.1 The core project activities include: (i) national forestry inventory necessary for preparing fuel wood supply master plans (SDAs) for the country's eight largest towns; (ii) establishment of 50 rural markets; (iii) management of 5 000 ha of State forests and 5 000 ha of private forests; (iv) creation of 3 000 ha of private forests and development (enrichment) of 50 000 ha of natural protected forests; (v) organization of the fuel wood sub-sector; (vi) promotion of women's activities with regard to forestry resources exploitation and development; (vii) support to the private sector in wood energy substitution, production and distribution of improved stoves;

(viii) rehabilitation of 200 km of access roads; (ix) construction of the project headquarters (Government), 10 offices/housing units, 3 agencies, 9 schools, 9 village health units (VHU) and drilling of 22 boreholes; and (x) compilation of a wood resources data base.

4.5.2. The project components include:

A. Development of sustainable production;
B. Promotion of alternative energy sources and energy economy;
C. Accommodating measures; and
D. Project management.

Component A: Development of Sustainable Production

This component comprises three sub-components:

4.5.3. Organization of the wood energy sub-sector: consists in setting up a consensus structure bringing together various vocational associations involved in the same activity sector. In order to rationalize the wood energy sub-sector, 50 rural wood markets (MRBs) which are timber exploitation zones around forestry resources and comprising sales points will be set up. The population in the immediate vicinity will manage the MRBs. Social infrastructure will be set up with the contribution of rural communities, with a view to improving the living standard. A note on the MRBs is attached in annex to this report (cf. Volume II).

4.5.4. The Sèmè, Pahou, Lama, Ouédo and Itchede State forests already reafforested by the PBF (5 174 ha) each has a participatory development plan which: (a) guarantees the sustainability of these forests; (b) contributes to a sustainable resolution of the illegal occupation of these forests by the neighbouring communities; and (c) allows for developing the existing timber capital. A scheme manager, team managers and overseers will represent the project in each State forest. Furthermore, the project will give necessary assistance to private farmers in preparing development plans for their plantations (4 801 ha).

4.5.5. The project will put supply master plans (SDAs) in place with a view to enhanced management of the wood energy sub-sector. In that connection, it will fund the national forestry inventory and consumer surveys. An outline of the terms of reference of the forestry inventory is given in annex (cf. Volume II).

4.5.6. Development of protected forests and promotion of village afforestation: involves the development (enrichment) of 50 000 ha of protected forests (natural) close to major consumer centres. The project will fund IEC activities, training on nursery, plantation and development methods, supply plants and sundry tools, provide supervision and support the preparation of participatory development plans for the forests concerned. Furthermore, the project will encourage the planting of 3 000 ha of village and private afforestation throughout the country by putting credit at the people's disposal. All these activities will be conducted within the MRB structured framework.

4.5.7. To conduct the range of activities mentioned above, the project will recruit a principal technical assistance staff (CTP, 5 years), international (forestry inventory 4 m/m, SIG 6 m/m, MRB creation 8 m/m) and national experts (forestry exploitation and development expert) for short periods (each 8 m/m). To implement this component, the project will also use the services of a DFRN engineer on secondment, assisted by three programme officers (SDA and MRB, State forest management, private plantation management and natural forest development). Moreover,

the project will build 10 offices/housing units located in various parts of the country and 3 agencies (South, Centre and North). Provision has also been made to procure means of transport for works implementation in various zones (2 tractor-trailers, 1 flat bed truck and 50 motorcycles). The Government will fund the procurement of 3 all-terrain vehicles. The component will also provide for office equipment, supplies and operating needs and consumables for the agencies.

Component B: Promotion of Alternative Energy and Energy Saving

4.5.8. This component comprises the promotion of alternative energy sources and support for the production and distribution of improved stoves. The alternative energy promotion component aims at strengthening the fuel wood substitution trend through other fuels, ensuring that that is done rationally. In order to encourage the use of alternative energy (gas, kerosene, solar, battery), loans will be put at the disposal of cooperatives, associations and artisans to procure and distribute domestic energy equipment (improve the production capacity, develop the distribution network, etc.).

4.5.9. For the implementation of the production component and distribution of improved stoves, the project will support private operators who wish to launch the production of improved stoves and enhance their use in households. It will contribute to gradually setting up an artisanal stove production network by helping to make loans available. It will bear the cost of a survey on the use of improved stoves, design of new prototypes, training of artisans (welders, iron benders, etc.). Furthermore, it will finance the IEC programme on the use of various forms of energy substitution. The implementation of the said component will use public sector channels (radio and television), the private sector, the cooperative networks, local radio stations and NGOs.

4.5.10. The project will also use the services of an energy engineer in the MEMH on secondment and will recruit two programme managers (private sector development, support for the promotion of alternative energy and distribution of improved stoves). The Government plans to procure one all-terrain vehicle; the project will finance two motorcycles and bear the cost of their operation and maintenance.

Component C: Accommodating Measures

4.5.11. This component concerns regulation, fiscality and sub-sector control reforms. The current forest tax and fee rates were fixed back in 1974, are now outdated, inadequate and in sore need of reform. Hence the project will help to put in place a new regulatory and fiscal mechanism aimed at: (i) the effective transfer of responsibility for managing wood resources and primary trade in fuel wood from the State to rural dwellers; (ii) orientation of fuel wood traders and transporters towards MRBs as the SDAs require; (iii) effective control of fuel wood flows; (iv) reduction of fiscal fraud; and (v) provision of a permanent tool for monitoring SDAs. Moreover, the project will with the DFRN set up a permanent fuel wood information and evaluation system (système d'information et d'évaluation permanente, SIEP), compile forestry statistics in terms of quality and quantity.

4.5.12. The project will put certain loans in place: (i) *short-term credit* (1 to 12 months): input procurement (seeds, bags, etc.), temporary labour, nurseries, product storage (wood, kerosene, gas, stoves, etc.), collection and processing of non-wood products, marketing

assistance, etc.; and (iii) *medium-term credit* (above 12 months): renewable energy production equipment (photo-voltaic cells, bio-gas, lighters, etc.), creation of plantations, etc. Each type of credit will have its own interest rate corresponding to the market rate.

4.5.13. The project will provide IEC activities for the benefit of sub-sector actors (operators, artisans, lumberjacks, traders/transporters, charcoal makers, saw men, collectors and other intermediaries), rural communities (people living in the vicinity of State, protected or private forests, etc.), women, structures participating in its implementation and monitoring (customary chiefs, locally elected officials, administrative authorities, etc.). It will also oversee the production and distribution of various thematic brochures in connection with the sustainable management of fuel wood, environmental education, MRBs, MST and HIV/AIDS control, health, hygiene, etc. These simple brochures in national languages will be distributed yearly in 300 villages.

4.5.14. Training of sub-sector actors will focus on: (i) literacy; (ii) themes specific to forestry resources (nurseries, plantation, maintenance, operation, carbonization, stacking, methods, etc.); (iii) MRB management (training of chairpersons, committee members, treasurers, secretaries, etc.); (iv) credit; (v) income-generating activities; (vi) land management; and (vii) strengthening of the technical capacity of DFRN staff. Trips to share experiences will be organized for project beneficiaries both at the national and sub-regional levels where similar projects are ongoing (Niger).

4.5.15. Special attention will be given to the involvement of women's cooperatives in activities relating to forestry resources management. To that end, loans will be put at their disposal for wood purchasing, transportation, sale of improved stoves, development of forestry by-products (honey, barks, leaves, fruits, etc.). The project will also provide training in various fields of activity (marketing, product processing, use of improved stoves, etc.). It is worth noting that women will be the main target with regard to the introduction of improved stoves.

4.5.16. The project will support research into forestry, sylviculture, agro-forestry and alternative energy in relevant research centres and specialized institutes. The aim is to encourage development research with a view to improving charcoal production methods (research, introduction of ovens, training) and other forms of biomass energy such as lighters (research, pilot units, extension). The project will finance research/development in specialized institutes and/or by NGOs. Loans will be put at the disposal of operators and users for the procurement of equipment on these new technologies.

4.5.17. The implementation of this component requires the short-term recruitment of two experts, one in forestry fiscality (6 m/m), the other in SIEP (basic data, 6 m/m), as well as a forestry law consultant (10 m/m). Furthermore, the Government will put at the project disposal two programme offices, one for coordination (information, sensitization, education, extension and training) and another for the energy database, reforms (regulation and fiscality) and their application. Within the framework of that component, various materials and equipment, documentation and publications will be procured.

Component D: Project Management

4.5.18. Given the scope of activities, the Government will put adequate premises at the project disposal to serve as the UGP headquarters. The Government will fund the procurement of two vehicles while the project will procure three motorcycles and other equipment necessary for its smooth implementation.

4.5.19. Project staff will comprise the director (PD) assisted by national staff put at his disposal and remunerated by the Government (1 DAF, 1 follow-up/evaluation manager, 1 communications specialist, 1 chief accountant and 1 cashier). The project will pay allowances to staff that the State will put at the project disposal and to support staff.

4.5.20. The project will finance operating expenses comprising all charges in connection with its field implementation (vehicle, motorcycle operation, offices, building maintenance, allowances, etc.). The project will also cover expenses on the audit (internal and external audit), environmental follow-up provided by the Benin Environmental Agency (ABE), the mid-term review (Year III of the project), preparation of an annual performance report and project final evaluation.

4.6. Production, Market and Price

Production

4.6.1. Fire wood production is mostly done through the collection of dead wood, recuperation of clearing products and felling of live trees. Production resulting from felled trees has developed in recent years and is currently one of the major urban supply sources. Moreover, the production zones outside state-owned forests tend to move increasingly towards the country's North owing to demography and pressure on forestry resources. Species used as firewood fall under two categories: (i) rapid growth species (*Acacia*, *Cassia*, *Eucalyptus*, *Filao*, etc.) and (ii) local species (*Albizia*, *Fagara*, *Dialium*, *Phylantus*, *Prosopis*, *Véné*).

4.6.2. Benin's annual fire wood production was estimated at 5 400 000 tonnes of wood in 1995. Not including farmers' on-farm consumption, fuel wood produced in various regions of the country is mostly sold in such major urban centres as Abomey, Cotonou, Djougou, etc. Annual fire wood consumption is currently estimated at 150 000 tonnes for Cotonou, 35 000 tonnes for Porto-Novo and 28 000 tonnes for Abomey and Bohicon. Based on a conversion factor of 0.5 tonnes per cubic metre, the total corresponding demand would exceed 300 000 m^3, to which should be added the charcoal demand. Moreover, the overall fire wood and charcoal consumption increases daily by 2.65%.

4.6.3. Projections up to 2020 show a production decline of nearly 12% compared with 1995, based mostly on the assumption of energy source diversification, including: (i) a demand for natural gas from 1.42 Mm3/d in 1999 to 4.53 Mm3/d in 2018 and the regional gas pipeline construction project; (ii) installation at Seme of a 120 MW gas thermal station; (iii) development of peat deposits to the West of Cotonou in the form of lighters to substitute wood and charcoal; and (iv) a probable fall in the production cost of solar energy.

4.6.4. Additional production from state-owned forests, private plantations and protected forests will at full development stand cumulatively at nearly 250 000 steres for a total turnover of nearly FCFA 9 billion. The project implementation should induce an increase in fire wood supply in the major urban centres through activities mentioned above.

4.6.5. Firewood is still produced through rudimentary artisanal carbonization methods so destructive of natural resources with an average weighted output of 15 to 20%. The project will ensure that more modern charcoal manufacturing methods are put in place, with higher output.

Market and Price

4.6.6. The potential fuel wood markets cover the country as a whole, from the production zones to the major urban centres via rural consumption centres. The major border region consumption centres also draw an informal but no less important fuel wood export commerce. A case in point is the city of Malanville (Alibori Department) which informally supplies Niger's Southern region.

4.6.7. Wood products are freely marketed. Prices are driven by supply and demand. Prices are fixed following the conversion of the cost of wood bundles (market unit) of nearly FCFA 400/unit into stere for firewood. Prices vary according to season (higher during the wet season), the site (closeness to the resource) and the market (rural or urban centre, wholesale or retail, etc.). The price of wood from state-owned forests varies depending on the distance of the site from the consumption centre. For instance, the cost price of a stere of wood produced in state-owned forests stand at FCFA 3 250 at Seme and FCFA 3 000 at Pahou, whereas the same stere is sold at FCFA 4 000 and FCFA 3 500 on site. These prices which only vary in state-owned forests are far below those charged by traders and retailers (FCFA 5 000 - 5 500).

4.6.8. Concerning charcoal, the sack of between 35 and 50 kg represents the market unit. Based on the PBF project experience, successful carbonization of one stere of wood using traditional technology can produce two sacks of charcoal. Prices are fixed per sack of 35 kg (nearly FCFA 2 000 - 2 500 per sack). On the market, prices vary depending on the season, the distance of the consumption centre from the production site and the charcoal quality (heavy or light) which is a function of the density of the wood used.

4.7. Impact on the Environment

4.7.1. The project is classified under Environmental Category II, showing that its potential negative impact may be reduced through the application of appropriate accommodating measures. Actions to maximize the project's positive fallout will also be implemented.

4.7.2. Positive Impact: by protecting the forest reserves concerned from uncontrolled cutting and by rehabilitating the vegetation (reafforestation or enrichment), the project will play a key role in conserving forestry resources and replenishing the zone's biodiversity. Several benefits will flow from participatory development with the involvement of the neighbouring population; that in turn will have a beneficial impact on replenishment of the biomass, dietary improvement (collection) and traditional pharmacopeia. The introduction of alternative energy sources such as gas will contribute to reducing the emission of greenhouse gases. The application of participatory development plans (PDPs) will help sustain forests by ending the risk of productivity loss related to stock aging.

4.7.3. Negative Impact: The potential negative impact of implementing the participatory development plans will be perceptible in areas of high anthropic pressure on natural resources where the risk of extensive use of land for agricultural purposes by the neighbouring population exists.

4.7.4. Operation via the mass felling method (clear cutting) could lead to soil erosion by intensifying the effect of runoff water, destabilizing slopes, altering the organic matter decomposition and nutritive element recycling process which might lead to soil structure modification. Also associated with felling are risks of forestry resources over-exploitation and biodiversity reduction. Impact on the fauna would result in the modification of the quantity and quality of habitats through their fragmentation by felling operations which could lead certain species to migrate or change their behaviour.

4.7.5. Accommodating measures: control of access to operating zones will limit the risk of anthropic activities (unauthorized felling or forest fires). The project will ensure that operating staff receive adequate training (felling methods, sylviculture notions, etc.) to minimize the risk of failure of natural regeneration. Damage to soils and the surrounding vegetation will be attenuated through adequate planning of various operations. Unsettled soil will be rehabilitated through re-seeding or plantations as soon as possible. Water quality protection will be provided via maintenance of vegetation belts around water courses.

4.7.6. Suitable harvest methods will be used depending on the forestry specie (*Acacia*, *Eucalyptus*, *Terminalia*, etc.), type of soil and forest (plantation, natural forest, etc.), sylviculture characteristics (stump height). Buffer zones will be set up between felling areas. To prevent the destruction or modification of fauna habitats, the project will ensure that the works schedule takes into account use of the territory by the fauna (migration, reproduction period). Other measures will include the preservation of the habitats of rare endangered species and protection of known birthing and passage areas.

4.7.7. Environmental Monitoring: the Benin Environmental Agency (ABE) which has the needed human and technical resources will provide environmental monitoring. ABE will ensure that the effective application of measures produce the expected impact based on pre-set follow-up indicators. In line with regulations in force in Benin and under ABE supervision, a simplified environmental assessment (SEA) of project activities will be conducted to identify corrective measures on the basis of which an environmental management plan (EMP) will be prepared in which will be repertoried all measures to mitigate the potential negative impact, the implementation of which will be the PMU's responsibility.

4.8. Social Impact

4.8.1. Impact on women: the project includes actions in favour of women, of which support to women's cooperatives and access to various loans. These actions will have significant effects, of which: (i) less hard labour and reduction of time loss thanks to the close availability of energy resources; (ii) improvement of their management capacity through women's training, sensitization and education on energy, alternative energy and credit; (iii) increase of economic power through the promotion of income-generating activities (wood purchase and transportation, sale of improved stoves, etc.); (iv) increase of income and improvement of the living standard by reducing energy cost; and (v) priority access to credit and savings by putting in place convenient financing systems (in terms of proximity).

4.8.2. Furthermore, forestry export activities underscore the possibility of intensifying extraction from various formations products such as shear butter, néré and several other non-wood products, wild fruits and vegetables that women could process, improving their income and living conditions in the process.

4.8.3. Other actions in favour of women and which have a non-negligible impact include: (i) assistance in reducing the hold of tradition [introduction of the "gender" approach to work methods]); (ii) functional literacy; (iii) IEC sessions on behaviour. These provisions should help in emancipating the rural woman, therefore children.

4.8.4. Impact on poverty: project activities will contribute to poverty reduction in the Departments concerned. Indeed, the establishment of MRBs will allow for the professionalization of the sub-sector and improvement of the living standard of actors. The construction of access roads to MRBs will open up such areas which, their height production potential notwithstanding, sometimes remain as pockets of poverty. Access to potable water, education and health, organization into cooperatives and support to cooperatives via credit are all actions that should enable the actors to enhance their income. These activities will generate seasonal and/or full-time employment (nearly 5 000) which will partly contribute to absorbing unemployment.

4.8.5. Increase in actual remuneration of daily farm labour will have the beneficial impact of keeping able hands in the village and on rural development. The project will conduct activities to meet the basic needs of the underprivileged, especially women and youths. Overall, these activities will contribute to improving the people's living standard.

4.8.6. The project will share actively in poverty control by promoting activities to meet the basic needs of the underprivileged, especially women and youths. The position given to women's activities in the development of the project zone will contribute to project sustainability by guaranteeing women's access to resources and decision-making, knowing that women are the core of the family and the foundation of society. The role that local authorities will play in activities scheduled and in decision-making, as well as the project's autonomy to work with other operators in the zone combine to promote project sustainability on the basis of social cohesion.

4.9. Project Cost

4.9.1. The cost of the project net of taxes and customs duty is estimated at FCFA 10 989.92 million (UA 11.75 million), including FCFA 4 922.84 million in foreign exchange (UA 5.26 million) and FCFA 6 067.08 million in local currency (UA 6.49 million). The cost was estimated on the basis of second quarter 2001 prices. It comprises 5% of contingencies on all base costs excluding staff expenses, technical assistance and services, and a 4% provision on inflation on all components. Table 4.1 below summarizes the project cost by component. Details are given in Annex 2.

Table 4.1
Summary of Project Cost Estimate by Component

Components	In FCFA Million			In UA Million			FE %
	For. Exc.	Loc. Cur.	Total	For. Exc.	Loc. Cur.	Total	
A. Development of sustainable production	3483.45	2120.90	5604.35	3.72	2.27	5.99	62
B. Promotion of alternative energy and energy economy	142.30	440.20	582.50	0.15	0.47	0.62	24
C. Accommodating measures	463.40	1455.95	1919.35	0.50	1.56	2.05	25
D. Project management	308.30	1400.16	1708.46	0.33	1.50	1.83	18
Base cost	4397.45	5365.73	9763.18	4.70	5.74	10.44	45
Contingencies	70.37	28.82	99.18	0.08	0.03	0.11	71
Inflation	455.02	672.54	1127.56	0.49	0.72	1.21	41
Total	4922.84	6067.08	1989.92	5.26	6.49	11.75	45

4.9.2 Table 4.2 below summarizes the project cost by expenditure category. Details are given

in Annex (cf. Volume II).

Table 4.2
Expenditure by Category

Categories	In FCFA Million			In UA Million			
	Loc. Cur.	For. Exc.	Total	Loc. Cur.	For. Exc.	Total	F.E. %
WORKS	1046.00	1088.00	2134.00	1.12	1.16	2.28	51
Development works	695.00	660.00	1355.00	0.74	0.71	1.45	49
Building construction	263.00	296.00	559.00	0.28	0.32	0.60	53
Boreholes	88.00	132.00	220.00	0.09	0.14	0.24	60
GOODS	21.30	739.30	760.60	0.02	0.79	0.81	97
Vehicles	0.00	146.00	146.00	0.00	0.16	0.16	100
Two-wheel vehicles	0.00	240.00	240.00	0.00	0.26	0.26	100
Computer hardware	0.00	89.10	89.10	0.00	0.10	0.10	100
Furniture	9.00	30.00	39.00	0.01	0.03	0.04	77
Agricultural equipment	0.00	50.00	50.00	0.00	0.05	0.05	100
Miscl. equipment	12.30	184.20	196.50	0.01	0.20	0.21	94
SERVICES	660.60	2009.40	2670.00	0.71	2.15	2.85	75
National forestry inventory	220.00	880.00	1100.00	0.24	0.94	1.18	80
Study	155.40	37.60	193.00	0.17	0.04	0.21	19
Supervision	25.00	0.00	25.00	0.03	0.00	0.03	0
Technical assistance	15.00	864.00	879.00	0.02	0.92	0.94	98
Consultancy services	158.20	104.80	263.00	0.17	0.11	0.28	40
Agreement	62.00	93.00	155.00	0.07	0.10	0.17	60
Audit	25.00	30.00	55.00	0.03	0.03	0.06	55
CREDIT	899.00	0.00	899.00	0.96	0.00	0.96	0
TRAINING	524.85	178.70	703.55	0.56	0.19	0.75	25
STAFF	791.64	0.00	791.64	0.85	0.00	0.85	0
OPERATIONS	1422.33	382.05	1804.38	1.52	0.41	1.93	21
Base cost	5365.73	4397.45	9763.18	5.74	4.70	10.44	45
Contingencies	28.82	70.37	99.18	0.03	0.08	0.11	71
Inflation	672.54	455.02	1127.56	0.72	0.49	1.21	40
Total	6067.08	4922.84	10989.92	6.49	5.26	11.75	45

4.10. Sources of Finance and Expenditure Schedule

4.10.1. The ADF, the Government of Benin and the beneficiaries will jointly finance the project. The ADF will fund 85% of total project cost (UA 10 million) covering all the foreign exchange cost and 76% of the local currency cost. The ADF will finance all components in concert with the Government. The Government will contribute 15% of the project cost amounting to FCFA 1 634.59 million (UA 1.75 million) and corresponding to (i) local staff salaries; (ii) procurement of vehicles; (iii) construction of the project headquarters; (iv) personal contribution for loans; (v) development works in protected forests, labour contribution for social infrastructure and access roads maintenance. The beneficiary population will cover items (iv) and (v).

Table 4.3.
Sources of Finance

Source	In FCFA Million			In UA Million			% Total
	Loc. Cur.	For. Exc.	Total	Loc. Cur.	For. Exc.	Total	
ADF	4591.88	4763.41	9355.28	4.91	5.09	10.00	85
Government	1475.21	159.43	1634.64	1.57	0.17	1.75	15
Total	6067.08	4922.84	10989.92	6.49	5.26	11.75	100

4.10.2. ADF participation in covering the local currency cost is justified by the project's poverty reduction objective and its relatively high foreign exchange cost. Furthermore, certain State investments to improve the living conditions of the people are of a social nature.

4.10.3. The breakdown of project cost by source of finance and component is given in Table 4.4 below:

Table 4.4.
Sources of Finance by Component (in UA million)

Components	ADF	Gov.	Total	%
A. Development of sustainable production	5.37	0.62	5.99	51
B. Promotion of alternative energy and energy economy	0.51	0.11	0.62	5
C. Accommodating measures	1.48	0.52	2.00	17
D. Project management	1.54	0.29	1.83	16
Base cost	8.90	1.54	10.44	89
Contingencies	0.09	0.02	0.11	1
Inflation	1.01	0.19	1.21	10
Total	10.00	1.75	11.75	100

4.10.4 The project's sources of finance by category of goods and services are given in Table 4.5 below.

Table 4.5.
Sources of Expenditure by Category

Categories	In FCFA Million			In UA Million		
	ADF	Gov.	Total	ADF	Gov.	Total
Works	1735.00	399.00	2134.00	1.85	0.42	2.28
Goods	614.60	146.00	761.60	0.66	0.16	0.81
Services	2670.00		2670.00	2.85		2.87
Credit	794.50	104.50	899.00	0.85	0.11	0.96
Training	703.55		703.55	0.75		0.75
Operations and staff	1804.38	791.64	2596.03	1.93	0.85	2.78
Base cost	8322.03	1441.14	9763.18	8.90	1.54	10.46
Contingencies	84.48	14.70	99.18	0.09	0.02	0.11
Inflation	948.77	178.79	1127.56	1.01	0.19	1.21
Total	9355.28	1634.64	10989.92	10.00	1.75	11.77

4.10.5 The expenditure schedule by component and category is given in Tables 4.6, 4.7 and 4.8.

Table 4.6
Expenditure Schedule by Component (in UA million)

Components	2002	2003	2004	2005	2006	Total	%
A. Development of sustainable development	1.52	1.80	1.04	1.03	0.60	5.99	51
B. Promotion of alternative energy and energy economy	0.13	0.12	0.12	0.12	0.12	0.62	5
C. Accommodating measures	0.28	0.47	0.46	0.48	0.30	2.00	17
D. Project management	0.48	0.32	0.33	0.35	0.34	1.83	16
Base cost	2.41	2.73	1.96	1.98	1.36	10.44	89
Contingencies	0.04	0.02	0.02	0.02	0.00	0.11	1
Inflation	0.10	0.22	0.25	0.34	0.30	1.21	10
Total	2.54	2.98	2.22	2.35	1.66	11.75	100

Table 4.7.
Expenditure Schedule by Category (in UA million)

Categories	2002	2003	2004	2005	2006	Total
Works	0.25	0.55	0.62	0.55	0.30	2.28
Goods	0.52	0.05	0.03	0.18	0.03	0.81
Service	0.91	1.16	0.29	0.25	0.24	2.85
Credit	0.13	0.18	0.21	0.25	0.19	0.96
Training	0.04	0.20	0.22	0.22	0.07	0.75
Operations and staff	0.56	0.57	0.58	0.53	0.53	2.78
Base cost	2.41	2.73	1.96	1.98	1.36	10.44
Contingencies	0.04	0.02	0.02	0.02	0.00	0.11
Inflation	0.10	0.22	0.25	0.34	0.30	1.21
Total	2.54	2.98	2.22	2.35	1.66	11.75

Table 4.8
Expenditure Schedule by Source of Finance

Sources	2002	2003	2004	2005	2006	Total	%
ADF	2.02	2.49	1.65	1.67	1.07	8.90	76
Government	0.39	0.24	0.30	0.31	0.29	1.54	13
Base cost	2.41	2.73	1.96	1.98	1.36	10.44	89
Contingencies	0.04	0.03	0.02	0.02	0.00	0.11	1
Inflation	0.10	0.23	0.25	0.34	0.30	1.21	10
Total	2.54	2.98	2.22	2.35	1.66	11.75	100

5. PROJECT IMPLEMENTATION

5.1. Executing Agency

5.1.1. The Project Management Unit (PMU) to be set up within the DFRN (under MAEP) will be the project executing agency. The PMU has considerable experience in implementing, supervising and managing forestry projects with the Bank. Indeed, the fire wood project was implemented under its responsibility, so too the ongoing Agoua, Mounts Kouffe and Wari-Maro Forest Reserve Development Project.

5.1.2. The PMU will coordinate the implementation of all project activities. In that connection, it will recruit highly qualified staff capable of successfully conducting the project's key operations: (i) coordination, support for activity promotion and participatory management of resources; (ii) planning, programming and project administrative and financial management; and (iii) coordination, follow-up/evaluation and monitoring of project activities. The PMU will enjoy financial and technical autonomy. It will be based in Cotonou, but will have three agencies set up (North, Centre and South) whose responsibility will be to concretely translate project actions in the field.

5.2. Institutional Provisions

5.2.1. Project Management: in view of the need to establish the institutional framework before having the local population implement the forest resources management contract, provision has been made to put in place an Orientation and Follow-up Council (conseil d'orientation et de suivi, COS), comprising officials of the ministries concerned. The COS membership will comprise: (i) the Chairperson (MAEP Secretary General; (ii) Vice President (Secretary General in the Ministry of Mining, Energy and Water Resources); (iii) Rapporteur (Project Manager); (iv) Members - (a) DCRE/MECCAG-PD Director; (b) CAA/MFE managing director; (c) Director of Energy/MMEH; (d) Director of the DPP/MAEP; (e) Director of the DFRN/MAEP; (f) 2 representatives of professional organizations from the fuel wood sub-sector. The COS's mission will involve: (a) monitoring the preparation of forest development plans and establishment of MRBs; (b) monitoring the preparation of the new forestry regulation plan (fiscal reform) and practical modalities for its application; (c) corrective measures in the face of problems or conflicts encountered while defining forestry management policies and strategies. The COS will meet twice yearly at the Chairperson's invitation.

5.2.2. A national manager (Project Director) whom the Government will appoint following Fund approval will head the project. In that regard, at least three candidates who meet the profile stated in annex (cf. Volume II) will be submitted to the Fund. The PD will be in charge of the project's routine administrative, technical and financial management, ensuring that it proceeds in line with national domestic energy and forestry resources policies. Furthermore, he will be the interlocutor vis-a-vis various agencies and Government representatives, as well as with the decentralized authorities. He will also be in charge of the COS secretariat (an organ that fulfills the functions of Board of Directors). In order to promote internal information flow and transparent management of the project, a *steering committee* will be set up, comprising the PD, the follow-up/evaluation, DAF and CTP managers, two component coordinators and the three agency managers. The consultative organ will meet every other month to check on the status of the budget, half-yearly and annual work plans, monitor the implementation of components and give technical opinion on all dossiers.

5.2.3. At the organizational level, various responsibilities will be catered for in the following manner: (i) Manager, Administration and Finance: he will be responsible for all project accounting, as well as material and human resources management. As qualification, he should hold the DECS; (ii) Manager, Follow-up/Evaluation: he will be in charge of coordinating technical programming activities and internal project follow-up/evaluation. He should be an experienced socio-economist; (iii) two component coordinators (production and supply): a DFRN engineer (agro-forestry, water and forestry) will direct the first component on secondment, while an energy engineer on secondment from the Directorate of Energy will be responsible for the second component; (iv) three agency managers: they will be charged with coordinating concrete field actions; all three will be forestry engineers on secondment from the DFRN. These officers will work closely with DFPRN managers in their respective fields and

will be supported at the local level by the forestry post manager (chef poste forestier,CPF) and scheme managers (chefs périmètres,CP) at State forest sites. Thee project organization chart is given in Annex 3.

5.2.4. Base structures: the key project base structures are: (i) the village structures (MRB) which will be set up and/or formalized and supported to make them operational; (ii) the scheme managers in State forests and post managers in protected natural or planted forests; (iii) traders/transporters of fuel wood who collect products at farm gate to make them available to consumers; and (iv) consumers in the rural areas, semi-urban and urban centres.

5.2.5. The participation of the local population in forestry development in the SDAs requires an internal organization capable of meeting the requirements of such development. Four kinds of structures will implement and follow-up the SDA: (i) organization structures set up by people living within the vicinity of forests; (ii) those of traders/transporters; (iii) those of consumers; and (iv) those of forestry authorities representing the State. During project implementation, each structure will receive specific support to set itself up and strengthen its activities. The new legislation on decentralization, forestry legislation and the fuel wood energy sub-sector will promote the establishment and operation of these new formalized structures.

5.2.6. Therefore, the surrounding inhabitants will develop various forests through their respective organizations, in concert with the Government. To that end, the project will ensure that legal statutes concerning village structures, administrative and financial procedures are adopted similar to what currently obtains and is provided for under the decentralization edicts.

Credit Management

5.2.7. Access to credit by various target groups participating in project activities will be facilitated through the establishment of a local credit system (in terms of proximity) currently used by specialized credit management NGOs and decentralized financial institutions. Within the project framework, the credit will be on-lent to decentralized financial institutions and NGOs licensed for the purpose by the Ministry of Economy and Finance. On-lending agreements will be submitted to the ADF for prior approval. It is worth noting that the CAA will coordinate, control and follow-up all credit activities. Prior to the start of the said credit activities, the CAA will prepare a circular addressed to financing institutions to provide them with necessary information to enable them to request for licensing.

5.2.8. To promote competition and retain the most efficient financial institutions, various decentralized financial agencies interested in credit management will be selected by a committee comprising representatives of the BCEAO, the MAEP and the MFE. The selection will be based on UEMOA prudential norms. The norms will be submitted to the Bank for prior approval. The financial institutions selected will be evaluated yearly. Those that no longer meet the norms will be struck off the list or suspended and would only be reconsidered when their performance would have improved.

5.2.9. Credit will be granted for sub-sector development activities, including the establishment and development of MRBs, nurseries, production and marketing of wood, charcoal, improved stoves, sale of gas, kerosene, etc. Promoters/producers will prepare their loan dossiers and forward them to financial institutions of their choice. The financial institutions will decide on extending credit based on their respective policies and regulations. The financial institutions will be solely responsible for loan recovery and should organize themselves in consequence.

5.2.10. The Bank will disburse credit resources and deposit them in special accounts open for

the purpose in commercial banks. The project will open a special account into which the credit funds will be paid. Each financial institution and NGO selected will make withdrawals depending on the annual farming season needs determined by the project and as it approves credit dossiers. Another account will also be opened in commercial banks to receive reimbursements. The CAA's Directorate of Public Debt which is responsible for preparing transfer vouchers in favour of beneficiary institutions will release funds to such establishments. Such vouchers will only be prepared when the CAA would have given the transfer order based on a conformity agreement from the project.

5.2.11. The financial institutions will regularly monitor credit beneficiaries and prepare quarterly credit control and follow-up reports. The CAA will undertake regular credit follow-up visits. The State will cover the exchange risk. In order to strengthen the guarantee system, the financial institutions selected could subscribe insurance policies to cover management of these credit funds.

5.3. Implementation Schedule

The project will cover a five-year period, dating from entry into force of the loan agreement. The estimated schedule for implementing major project activities is shown in Table 5.1 below:

Table 5.1
Implementation Schedule

Activities/actions	In Charge	Start	Duration
Board approval	ADF	September 2001	02 days
Loan agreement signature	GVT/ADF	December 2001	
General procurement note	MDR/ADF	December 2001	
Entry into force and first disbursement	MDR	June 2002	
Establishment of the PMU, staff secondment and recruitment	MDR	January 2002	
Project start-up workshop	PMU	January 2002	
Preparation and approval of the short list of consultants	PMU	February 2002	
Bid invitation	PMU	March 2002	
Bid invitation for the forestry inventory	PMU/MDR	April 2002	
Bid reception and opening	PMU/MDR	June 2002	
Signature of contracts	PMU/MDR	July 2002	
Start of inventory works	PMU/Consult.	August 2002	2 years
Bidding, contracts and delivery of vehicles	PMU/MDR	June 2002	
Bidding, contracts, construction and access road works	PMU/MDR	June 2002	
SDA studies	PMU/Consult.	September 2002	1 year
Start of forestry development works	PMU/MRB	January 2003	4 years
Start of training	PMU	September 2002	4 years
Scholarships and training abroad	PMU	July 2003	3 years
Credit put in place	PMU	December 2002	4 years
Mid-term review	PMU/Consult.	July 2004	2 months
Project completion report	PMU	March 2006	
ADF completion report	ADF	July 2006	

5.4. Procurement Arrangements

5.4.1. Procurement arrangements are summarized in Tables 5.2 and 5.3 hereunder. All goods, works and services procured with Bank financing shall conform with Bank rules and procedures on the procurement of goods and works or, as the case may be, Bank rules and procedures for the use of consultants, using the appropriate standard Bank bidding documents.

Table 5.2
Arrangements for the Procurement of Goods, Works and Services (UA million)

Categories	In UA Million					
	ADF				Excluding ADF	
	NC	**CFEN**	**OTHER**	**SL**	**Government**	**TOTAL**
WORKS	**0.72**		**1.13**		**0.42**	**2.28**
Works			1.13		0.32	1.45
Construction	0.49				0.11	0.60
Boreholes	0.24					0.24
GOODS		**0.66**			**0.16**	**0.81**
Vehicles					0.16	0.16
Two-wheel vehicles		0.26				0.26
Computer hardware		0.10				0.10
Miscl. Equipment		0.04				0.04
Agricultural equipment, trucks		0.11				0.11
Other equipment		0.15				0.15
SERVICES				**2.85**		**2.85**
National forestry inventory				1.18		1.18
Studies				0.21		0.21
Supervision				0.03		0.03
Technical assistance				0.94		0.96
Consultancy services				0.28		0.28
Agreements				0.17		0.17
Audit				0.06		0.06
TRAINING				**0.75**		**0.75**
CREDIT			**0.85**		**0.11**	**0.96**
STAFF					**0.85**	**0.85**
OPERATIONS			**1.93**			**1.93**
Unallocated						**1.31**
Total	**0.72**	**0.66**	**3.91**	**3.62**	**1.54**	**11.75**

5.4.2. The PMU will be responsible for awarding goods, works, services and training contracts. Goods, works and services will be procured according to ADF rules, as follows:

i. Competition on the basis of a short list (SL): for the implementation of forestry inventory works for UA 1.18 million and technical assistance for UA 0.94 million. In view of the specific nature of forestry inventory works, consulting firms will be prequalified in accordance with Bank procedures;

ii. National competition (NC): (i) rehabilitation works on 200 km of rural roads for a total value of UA 0.43 million; (ii) implementation of service infrastructure construction works (offices/housing units) for a maximum of UA 0.25 million; (iii) small scale and dispersed construction works (VHUs and schools) will be granted to SMEs after pre-selection for a maximum value of UA 0.24 million; (iv) borehole drilling works for a total of UA 0.24 million; the country has enough firms to guarantee competition; the maximum amount per contract will not exceed UA 0.35 million;

iii. Competition on the basis of a short list (SL): for the recruitment of: (i) operators and/or NGOs responsible for conducting IEC, coordination, sensitization and training for a maximum value of UA 0.48 million; preparation of extension manuals for a maximum of UA 0.09 million; (ii) consulting firms to conduct studies, monitor and follow-up feeder road, borehole, VHU and school construction works for UA 0.06 million; (iii) annual project performance status, mid-term evaluation, final evaluation, external accounts audit, for UA 0.14 million; (iv) consulting firms to prepare SDAs and development plans for a total of UA 0.11 million; (v) research on alternative energy, improved stoves, etc. amounting to UA 0.23 million; (vi) firms in charge of preparing administrative and accounting procedures manual for UA 0.01 million. The publication of tender notices will be limited to the national press in view of the limited maximum amount of UA 0.48 million;

iv. National shopping: for the procurement of motorcycles, tractor-trailers, flat bed trucks (UA 0.36 million), office and other equipment (UA 0.25 million); there are enough firms in the country to guarantee competition, and the maximum amount of each contract will not exceed UA 0.20 million;

v. Other procurement methods will be used as shown in Table 5.3; national shopping is justified thanks to the large number of qualified national suppliers and representatives of foreign suppliers to guarantee competitive prices;

- Agreements: will be signed with agencies and specialized public operators, namely: the ABE for environmental monitoring, INRAB for forestry research and other institutes for energy economy. The total amount involved will not exceed 0.17 million. The agreements signed directly with such institutions will not be used to fund equipment or fees but to cover operating expenditure induced by activities mentioned in the agreements;

- Goods funded on credit (procurement of input, purchase of miscellaneous products, artisanal processing equipment, temporary labour, sundry stocks, transportation, nurseries, etc.): the beneficiaries will sign contracts based on commercial practices acceptable to the Fund.

Table 5.3
Other Procurement Arrangements (in UA million)

Procedure	Goods	Amount per Contract	Maximum Total
National shopping	Office equipment, other equipment, etc. Tractors Trucks	UA 0.15 million UA 0.08 million UA 0.08 million	UA 0.30 million UA 0.08 million UA 0.08 million
Direct negotiation	Operations (fuel and spare parts, office consumables, water, electricity, post and telecommunications, etc.) Plant production (seeds, sachets, etc.).	UA 0.23 million UA 0.20 million	UA 1.13 million UA 0.80 million

5.4.3. General Information Note on Procurement**:** the text of the General Information Note on Procurement will be agreed with the borrower during negotiations and issued for publication in *Development Business* following approval of the loan proposal by the Bank's Board of Directors.

5.4.4. Review Procedures: the following documents will be submitted to the Bank for review and approval prior to publication: (i) special information note on procurement; (ii) bidding documents; (iii) bid appraisal reports comprising contract award recommendations; and (iv) draft contracts if those included in the bidding dossiers were modified.

5.5. Disbursement Arrangements

5.5.1. The borrower will provide the Fund with proof of opening (a) a special account in a commercial bank into which the loan resources will be paid; (b) an account at the General Directorate of the Treasury and Public Accounting into which the counterpart contribution will be paid; and (c) a sub-account of the special account in the commercial bank into which funds on-lent to decentralized financing institutions will be paid. The Bank will disburse the credit component through special accounts open for the purpose in commercial banks and by tranche, based on the annual programme prepared beforehand by the project and approved by the ADF.

5.5.2. Subsequent disbursements will be authorized following justification of at least 50% of previous expenditures. In that regard, the following documents shall accompany disbursement requests: (i) study brief providing information on the sub-project; (ii) technical brief showing what results are expected of the sub-project (production, turnover, expenditure, financial performance before and after loan reimbursement, management ratios); and (ii) statement of special accounts open in commercial banks into which credit funds are paid; the statements should be prepared by the banks themselves.

5.6. Follow-up and Evaluation

5.6.1 At each level, the project will have a simple follow-up/evaluation system. The system will be designed in a way that would permit comparisons between project activities in various zones. Follow-up/evaluation will help cover: (i) the technical aspects with regard to the achievement rate of activities and objectives, and impact on the natural and socio-economic environment. On that basis, it would be possible to judge the rationale of set objectives and if necessary propose readjustments; (ii) aspects relating to national institution building in terms of training, introduction and mastery of new evaluation methods and performance of services provided; (iii) budgetary aspects and use of human and material resources comparing planned activities to actual achievements.

5.6.2. Internal Follow-up: each intervention zone should provide follow-up/evaluation of its own activities using simple follow-up and evaluation forms containing only necessary information indicating ratios for use in rapid and simple analysis. Based on these and its own forms, project Management will provide internal monitoring and evaluation of all activities from which it will draw conclusions that will serve as pointers to future activities and budgets. Beneficiaries will play an active role in internal follow-up activities.

5.6.3. External Follow-up: the DFRN, the Directorates of Programming and Prospects (DPP) of the MAEP and the MMEH and, above all, the Orientation and Follow-up Council (COS) provide external follow-up using information from missions that they should conduct at least once yearly. The related results will be sent to the ADF. The ADF will also supervise the project through regular follow-up missions, as was the case during the implementation of the PBF Project.

5.6.4. Environmental Follow-up: the environmental follow-up by the Benin Environmental Agency (ABE) will verify and monitor the implementation of measures to mitigate the negative impact associated with project execution. Furthermore, it will strive to put in place norms and measures for the sound management of forest reserves, prepare annual reports emphasizing key issues including the SDA, run stands in rural markets and undertake IEC activities among various local actors.

5.6.5. Mid-term review: provision has been made for a mid-term review during the project's third year to match its achievements against specific objectives and, where necessary, re-orientate or modify actions.

5.7. Financial and Audit Reports

The project implementation unit will keep the project accounts. The unit will keep the general and analytical accounts and organize budget monitoring in line with the SYSCOA system. In that regard, the project will set up a financial and accounting management system. The unit will keep separate account of ADF-funded operations. The provision also concerns the credit component resources. Agencies that will be committed by agreement to the project will open separate accounts for operations funded within the project framework. Project accounts will be subject to the usual public administrative controls. Furthermore, there are plans to audit the accounts yearly with a view to reviewing the project's financial performance. An independent firm recruited following competition on the basis of a short list will conduct the audit. The ADF loan will finance the audit cost. The Ministry's internal audit will prepare an annual report which will be forwarded to the ADF.

5.8. Coordination with Other Donors

5.8.1. During the appraisal of the project under discussion, activities planned were discussed with all donors whose actions remain complementary and are conducted in specific forests. Indeed: (i) the ADF is jointly financing the Agoua, Mounts Kouffe and Wari-Maro Mountains Forest Reserve Project (PAMF) with ABEDA; (ii) Netherlands Cooperation plans to fund an operation on management of forest species, physical development and implementation of development plans for two forest reserves and a palm plantation; (iii) the GTZ and Agence Française de Développement (AFD) are jointly financing a new land and natural resources management project (PGTRN); (iv) the World Bank plans to continue the PGRN forestry development by taking seven other forest reserves into account; (v) Japanese Cooperation, in concert with CENATEL, is conducting studies and collecting data on three forest reserves with a view to preparing development plans for them; (vi) the European Union is involved in the development of the W Park; (vii) the World Bank is supporting Benin through the RPTES Programme; and (viii) the GTZ is funding the Bassila Region Forestry Resources Restoration Project.

5.8.2. Therefore, there is sufficient coordination of operations in the forestry sub-sector among donors. The project under discussion is in sync with other donors' activities and fits into the energy sector under the RPTES Programme. Overall, however, it is indispensable at the national level to put in place better planning and coordination of activities between public/private structures and donors.

6. SUSTAINABILITY AND PROJECT RISKS

6.1. Recurrent Expenditure

The project recurrent expenditure mostly comprise forestry activity costs (reafforestation, fire breakers, etc.) and maintenance of socio-economic infrastructure (boreholes, schools, VHUs and feeder roads). The beneficiary population will bear such recurrent expenditure (the beneficiaries are responsible for reafforestation in each MRB). Indeed, thanks to the new form of forestry product taxation being prepared and the receipts it is hoped to generate (nearly FCFA 30 000/ha, i.e. about FCFA 600 million/year), it will be possible to bear such expenditure with a domino effect at the local (communal) and central administration level. It will also permit the development of local governments and guarantee each partner the possibility of successfully playing its role.

6.2. Project Sustainability

6.2.1. The basic principle of participatory forestry development is founded on sustainability through regular reinvestment of part of the income from forestry exploitation, on the one hand, and on the other, the share of a management contract between the Administration in its capacity as guarantor of the national heritage and the neighbouring communities (MRB) who are the direct beneficiaries of that heritage. That would guarantee both project and resources sustainability. Therefore, the MRBs will sign a forestry management contract with the Administration in which the exact share of operating income will be stated. Within that context, a development fund will be set up within the new reform context to cover all recurrent development costs.

6.2.2. The Bank's experience in implementing similar projects, especially the South Benin Fire Wood Plantations Project (BPF) shows that the success encountered in attaining the objectives is basically the result of the people's support to the development programmes retained due to the substantial increase in income, setting of land ownership through physical apportioning of plots and improvement of soil fertility which leads to the perpetual renewal of resources. By encompassing all these factors, the Firewood Project - Phase II has in-built all elements of sure sustainability.

6.3. Major Risks and Accommodating Measures

6.3.1. During project implementation, the following assumptions and risks are possible: (i) vagaries of the weather may influence the plantation success rate; (ii) several ministries may seek institutional support; for that reason, right from the start, each ministry's role should be clearly determined. The Orientation and Follow-up Council (COS) bringing together the ministries concerned could avoid and overcome such risks; (iii) derailing due to poor interpretation of decentralization texts by political actors and their electorate may be avoided through sensitization, communication and training; (iv) there is fear of slow progress in reviewing procedures and adapting fiscal reforms; (v) there are also fears that vocational associations set up under the fuel wood sub-sector framework may become more concerned with fighting for

classification rights than sustainable resources management. That risk may be avoided through training, sensitization and communication; and (vi) lack of political commitment to fiscal reforms. It is necessary to use the multi-disciplinary approach, taking into account human dynamics and socio-economic constraints in supply zones, plan an incentive-based reform and draw considerable attention to information and increased transparency of actions, while avoiding inter-village conflicts.

6.3.2. The project's key assumption is based on full support of the rural population and farmers' cooperatives to its orientations and objectives. That assumption is realistic in the light of the key role that the project assigns to participation and consultation. Indeed, all project components are based on a participatory approach that takes into consideration the needs and initiatives of beneficiaries and their organizations. The OPs will organize participatory workshops with the support of operators (NGO) recruited by the project. Such workshops will take into account land use issues with a view to finding the needed solutions.

6.3.3. Inadequate staff mobilization, especially of the DFRN which has a key role to play, may present a level of risk. The projected accommodating measures, especially in terms of training, offices/housing units, equipment and allowances should significantly reduce that risk.

6.3.4. Beneficiaries' difficult access to credit and their reimbursement capacity may in themselves constitute risks. Such risks will be minimized since a network of capable and experienced financing institutions will manage the credit. The CAA will monitor approved credit institutions and intervene to withdraw licence from those that flout credit management regulations. Decentralized credit will improve access to micro-credit by the underprivileged. Expected production will provide farmers with enough income to cover credit reimbursement.

7. PROJECT BENEFITS

7.1. Financial Analysis

7.1.1. The financial analysis concerns study on two operating accounts derived from the PBF project experience, comparing a nursery that the project set up and another established by a private operator. The second compares a hectare of plantation that the project cultivated and one privately owned. For the nursery, the projected costs indicate a range of between FCFA 24/plant for the private operator to FCFA 40/plant for the project, the difference attributable to the level of technical supervision used. There is also a gap in connection with the cost of installations per hectare of plantation (FCFA 50 000 for the private operator against FCFA 95 000 for the project, excluding supervision charges), as there is for the operating expenditure during the 6 - 7 years period before maturity.

7.1.2. Hence within the project framework, the implementation of various activities produces the following additional positive income: (a) Model I of the project nursery, at a cost price of FCFA 50/plant produces an additional annual income of FCFA 661 000 for three production cycles yearly; (b) Model II practised by a private operator without mechanization and supervision produces an additional annual income of FCFA 1 275 000/3 cycles, i.e. FCFA 106 250 monthly; (c) Model III corresponding to running one hectare of fire wood plantation by the project produces 166 steres of wood sold at FCFA 3 500/stere, giving FCFA 134 282, whereas (d) Model IV of private plantation gives an additional substantial income of FCFA 261 100. The financial analysis of various models studied indicates that the project option to promote private nurseries and forest plantations is reasonable and will have a substantial positive impact on beneficiary income.

7.2. Economic Analysis

7.2.1. The economic analysis was conducted on the basis of additional cash-flow calculations (project and no-project situation) over a twenty-five year period. All the project costs were included in the return calculation. The cost of imported equipment was calculated net of taxes and customs duty. Other costs were estimated at market prices; indeed, taxes and subsidies are practically absent, trade is free and real differences between market and economic prices are minimal. The economic analysis retained the financial prices used in the operating accounts. The project cost was broken into four categories: investments relating to the development of protected and private forests, promotion of demand and diversification of energy sources, strengthening of capacity and expenditure directly related to project operations, development maintenance and/or renewal. The economic benefits come from additional forestry production during development of private forests, enriched forests under the project protection and exploitation of state-owned forests. Private and village nursery production was taken into consideration with regard to reafforestation and enrichment needs planned over the project's five years. The project produces a rate of return of 18.82%. The rate is acceptable within the context of a project of this nature (structuring and incentive-driven), in which the emergence of private initiative will only be gradual, notwithstanding support activities. The ERR calculation is given in Annex 5.

7.2.2. The project's tangible benefits result from the increase in fire wood and charcoal production. The project will also give impetus to trade in alternative energy with a socio-economic impact far beyond the increase in marketed production. In addition, it will contribute to natural resources protection, the impact of which is immeasurable. Efforts on training, restructuring of the sub-sector (MRB), administration, farmers' cooperatives and traders are a major project asset. Various infrastructure, training and access to credit are all immeasurable benefits and make up a set of improvements to the socio-economic environment in favour of project beneficiaries.

7.3. Analysis of the Social Impact

7.3.1. The project will significantly contribute to improving the income of the beneficiary population particularly by developing income-generating activities and promoting the rational exploitation of forestry resources in the zone. Thus the villages will enjoy the usufruct of rational resources management; their rights will be specified, their natural resources management and community organizational capacity strengthened and recognized.

7.3.2. Most project activities will generate jobs and income. Therefore, job creation is a key poverty reduction indicator especially in the rural area where the poverty threshold stands at nearly FCFA 56 500 per annum. Activities planned will create two types of jobs: direct and indirect. Direct jobs are those filled by project implementation managers and workers. Indirect jobs (far numerous) are associated with all project activities most of which require considerable labour. Indeed, the project will create jobs for the beneficiaries in view of the labour needed for clearing, rural forest enrichment, plantations, nurseries and fuel-wood exploitation, as well as economic agents on the sub-sector's downstream and other activities linked to the sub-sector (bee farming, pharmacopeia, etc.).

7.3.3. The project will also permit a substantial increase in fiscal receipts in connection with fuel wood trade through the combined impact of tax rate review and increase in the quantity produced and marketed.

7.3.4. The project will play a significant role with regard to poverty reduction. Indeed, the project is a key social operation in its impact zone. The social nature is seen through one of its objectives, namely improvement of the people's living standard in an area with the highest poverty threshold. Measures such as improvement of production methods, development of MRBs and establishment of a credit structure all aim at reducing the poverty level in the short, medium or long term. The strengthening of institutional capacity by encouraging the population to steer its own development is also founded on the egalitarian principle aimed at improving the people's living conditions. The enhancement of the socio-economic status of vulnerable groups, especially women, will contribute to poverty reduction. Indeed, within the project framework, the place accorded women's activities, their priority and participation in the zone's development operations and access to resources and decision-making, are all tangible elements of the drive to reduce poverty.

7.4. Sensitivity Analysis

The rate of return sensitivity tests were conducted and concern cost increases and production fall. A 10% increase in the project cost will bring the ERR down to 14.15% or a fall of 28.81%; inversely, a 10% fall in production will reduce the ERR to 13.70%, or a decline of 27.20%. The project's ERR is more sensitive to a decline in production than an increase in costs even where such an increase is significant. Therefore, it is up to managers of the fuel wood supply and demand components to ensure, through their coordination, supervision and promotion (especially support and credit) that the quantitative objectives regarding the area to be developed and output are met in order to sustain and maintain the estimated 18.82% ERR.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 The project will contribute to supplying the country's urban centres with sustainable and varied domestic energy. It is fully in sync with the objectives of Benin's 1998 - 2002 Orientation Plan with regard to sylviculture since it will share in: (i) developing forestry products; (ii) defining a forestry management programme for wood supply; (iii) preparing participatory development plans for enhanced forestry resources management; and (iv) promoting SMEs in the wood sub-sector. The project lays emphasis on an ecologically sustainable exploitation of timber resources and reafforestation. It is equally in line with the commitments of the framework agreement on climatic change, the convention on biological diversity, the convention on desert control and the general agreement on forests.

8.1.2. The set objectives, notably the planning and management of the traditional energy sector in order to sustainably meet the increasing domestic energy demand, improve the supply/demand performance of fuel wood and sustainably manage resources will contribute to improving the living conditions, all within the context of the country's economic and social development policy. The project implementation with the participation of the beneficiary population, especially women, school dropouts, farmers' and traders' associations will consolidate the achievements of the Fire Wood Project (PBF) which marked the first phase, and sustain various development activities. The project is considered as technically feasible and viable at the economic, financial and economic level. Its rate of return stands at 18.82%. In the light of the foregoing, it is recommended that the Republic of Benin be granted a loan not exceeding UA 10 million from ADF resources, subject to the conditions set forth in the loan agreement.

8.2. Recommendations and Loan Conditions

. The ADF loan extended to the Government of Benin shall not exceed UA 10 million. The loan shall be granted subject to the following conditions:

A. Conditions Precedent to Entry into Force of the Loan

Entry into force of the loan shall be subject to the Borrower fulfilling the conditions set forth in Section 5.0.1 of the General Conditions.

B. Conditions Precedent to First Disbursement

i. show proof to the Fund of establishing the Project Management Unit (PMU) within the DFRN (cf. § 5.1.1.) ;
ii. show proof to the ADF of establishing the Coordination and Follow-up Council (COS) (cf. § 5.2.1.);
iii. show proof to the Fund of appointing the Project Manager whose CV, qualifications and experience the Fund would have considered acceptable beforehand (cf. § 5.2.2.);
iv. show proof to the Fund of assigning staff (1 DAF, 1 follow-up/evaluation manager, 1 chief accountant, 1 communication specialist, 1 cashier, 7 programme officers, 2 coordinators, 3 agency managers and 1 IT officer) whose curricula vitae the Fund would have considered acceptable beforehand (cf. 4.5.20);
v. show proof to the Fund of opening: (a) a special account in a commercial bank to receive the loan resources; (b) an account at the General Directorate of the Treasury and Public Accounting into which the State counterpart financing will be paid; and (c) a sub-account of the special account open in the a commercial bank into which resources on-lent to decentralized financial institutions will be paid (cf. § 5.2.11.) ;
vi. present to the Fund for prior approval the draft on-lending agreement to be concluded between financial institutions responsible for credit and the PMU (cf. § 5.2.8);
vii. undertake to enforce all fiscal and regulatory reforms recommended by studies (cf. 4.5.11.);
viii. undertake to put premises for use as the PMU headquarters at the project's disposal (cf. 4.5.19.).

C. Other Conditions

Furthermore, the Borrower shall:

i. put at the project disposal premises for use as the PMU headquarters not later than 30 June 2002;
ii. show proof to the Fund of the participatory natural forest development plan not later than 31 December 2005;
iii. show proof to the Fund of the new forestry regulation not later than 31 December 2005;
iv. provide the Fund with the on-lending agreement concluded between financial institutions responsible for credit and the PMU not later than 31 December 2001;
v. show the agreements concluded between the PMU, the ABE, INRAB and institutes/NGOs for technique promotion and improvement (charcoal, improved stoves and biomass, etc.) not later than 31 June 2002.


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Annex 2

SUMMARY OF PROJECT COST (FCFA '000 and UA Million)

Component	2002	2003	2004	2005	2006	Total	Loc. Cur.	For. Exc.	UA
A - DEVELOPMENT OF SUSTAINABLE PRODUCTION	**1420.40**	**1688.20**	**970.10**	**966.15**	**559.50**	**5604.35**	**1187.60**	**1465.40**	**5.99**
A1 – Supply master plan	489.50	702.00	0.00	0.00	0.00	1191.50	301.50	890.00	1.27
A2 – Establishment of rural markets	71.90	384.20	395.90	292.50	52.00	1196.50	621.10	575.40	1.28
A3 – Management of state-owned forests	83.00	83.00	63.00	18.00	18.00	265.00	265.00	0.00	0.28
A4- Promotion of village reafforestation	29.40	118.00	295.20	340.40	290.00	1073.00	653.00	420.00	1.15
A5 – Sub-sector organization	11.00	11.00	11.00	3.00	3.00	39.00	39.00	0.00	0.04
A6 – Technical assistance	201.00	201.00	120.00	120.00	114.00	756.00	0.00	756.00	0.81
A7 – Building construction	524.40	178.80	74.80	182.05	72.30	1032.35	190.30	842.05	1.10
A8 - Staff	10.20	10.20	10.20	10.20	10.20	51.00	51.00	0.00	0.05
B - PROMOTION OF ALTERNATIVE ENERGY AND ENERGY ECONOMY	**120.90**	**116.40**	**116.40**	**116.40**	**112.40**	**582.50**	**440.20**	**142.30**	**0.62**
B1 – Support to the private sector and alternative energy	61.50	61.50	61.50	61.50	61.50	307.50	307.50	0.00	0.33
B2 – Support for improved stoves	7.00	24.50	24.50	20.50	20.50	97.00	89.80	7.20	0.10
B3 – Counselling assistance	20.00	20.00	20.00	20.00	20.00	100.00	0.00	100.00	0.11
B4 – Staff, equipment and operations	32.40	10.40	10.40	14.40	10.40	78.00	42.90	35.10	0.08
C - ACCOMMODATING MEASURES	**261.96**	**443.14**	**431.79**	**446.64**	**284.34**	**1867.87**	**1404.47**	**463.40**	**2.00**
C1 - Information, sensitization (IEC)	4.50	35.00	16.00	44.50	5.50	105.50	55.70	49.80	0.11
C2 – Training	4.40	125.70	149.85	125.70	17.40	423.05	294.15	128.90	0.45
C3 – Promotion of women's activities	53.20	74.20	88.20	123.20	123.20	462.00	462.00	0.00	0.49
C4 – Credit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5 – Reforms	0.00	20.00	30.00	15.00	10.00	75.00	75.00	0.00	0.08
C6 – Creation of data base	0.00	16.38	7.38	7.38	7.38	38.52	23.52	15.00	0.04
C7 – Research	27.00	27.00	27.00	27.00	27.00	135.00	54.00	81.00	0.14
C8 – Technical assistance	49.50	49.50	21.00	1.50	1.50	123.00	15.00	108.00	0.13
C9 – Equipment and operations	82.56	82.56	82.56	82.56	82.56	412.80	412.80	0.00	0.44
C10 – Equipment and operations	40.80	12.80	9.80	19.80	9.80	93.00	12.30	80.70	0.10
C11 – Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D - PROJECT MANAGEMENT	**448.62**	**303.21**	**313.21**	**325.21**	**318.21**	**1708.46**	**1348.66**	**304.80**	**1.83**
D1 – Buildings	55.00	0.00	0.00	0.00	0.00	55.00	0.00	58.00	0.06
D2 – Rolling stock	52.00	0.00	0.00	6.00	0.00	58.00	0.00	50.00	0.06
D3 – Equipment	34.00	0.00	0.00	16.00	0.00	50.00	125.00	150.00	0.05
D4 – Operations	55.00	55.00	55.00	55.00	55.00	275.00	1055.96	0.00	0.29
D5 – Staff	208.32	211.91	211.91	211.91	211.91	1055.96	167.70	46.80	1.13
D6 – Miscl. services and audit	44.30	36.30	46.30	36.30	51.30	214.50	0.00	0.00	0.23
Base cost	**2251.88**	**2550.95**	**1831.50**	**1854.40**	**1274.45**	**9763.18**	**4380.93**	**2375.90**	**10.44**
Contingencies	35.36	23.03	17.50	21.00	2.30	99.18	28.82	70.37	0.11
Inflation	91.49	210.04	230.87	318.55	276.61	1127.56	672.54	455.02	1.21
Total	**2378.72**	**2784.01**	**2079.87**	**2193.95**	**1553.36**	**10989.92**	**5082.28**	**2901.29**	**11.75**

REPUBLIC OF BENIN

FIRE WOOD PROJECT – PHASE II (PBF-II)

ENVIRONMENTAL INFORMATION NOTE

1. Project Impact on the Environment

Category and Justification

The project is classified under Environmental Category II, meaning that the project's limited negative impact potential could be reduced by applying appropriate accommodating measures. Other measures aimed at maximizing the project's positive effects will also be implemented.

Positive Impact

By protecting the forest reserves concerned from uncontrolled felling and rehabilitating the vegetation (reafforestation or enrichment), the project will play a key role in protecting forestry resources and replenishing the zone's biodiversity. Several benefits will result from participatory development (involvement of the surrounding population), with a positive impact on the replenishment of the biomass, nutrition and traditional medicine.

The introduction of such alternative energy sources as butane will help reduce pressure on wood resources. Since such resources are less polluting than traditional fuels (wood and charcoal), their use will reduce green house gas emission. The application of participatory development plans (PDPs) based on the sustainable output principle will permit the preservation of existing timber stock, countering the risk of productivity loss associated with aging stock and guaranteeing their protection through the support of the local population.

Negative Impact

The potential negative impact of implementing the PAF will be perceptible in areas with the highest anthropic pressure on natural resources and a prevailing risk of village communities losing land otherwise used for other purposes. Forest regeneration operations would be compromised if the surrounding population were not made aware of the need to sustain resources and sufficiently motivated for involvement in the participatory development process.

Exploitation using the total felling method as practised within the framework of plot operations could result in soil erosion by intensifying the impact of runoff water, destabilizing slopes, altering the organic matter decomposition and nutritive element recycling process, eventually leading to a modification of the soil structure. The risk of over-exploitation of forestry resources and biodiversity reduction is also associated with felling. The impact on the fauna will lead to the modification of the quantity and quality of habitats through their fragmentation during felling operations. That could in turn cause certain species to leave or change behaviour.

Accommodating Measures

Control of access to operation zones will help limit the risk of farmers moving in to settle (which could result in unauthorized felling or provoke forest fires). The project will offer adequate training to the operating staff (felling techniques, sylviculture notions, etc.) with a view to minimizing the risk of failure of natural regeneration. Measures will be taken to further involve the surrounding population in the planning and operating process, and the use of local labour encouraged.

Damage to the soil and surrounding vegetation will be attenuated through adequate planning of haulage feeder road alignment. Soil disrupted will be rehabilitated through sowing or plantations as soon as possible. The reduction of the duration of operations in sensitive areas will help protect the soil. Moreover, operations should preferably be completed before the rainy season so as not to disturb regeneration. The water quality will be protected through the maintenance of vegetation belts around water courses. During the construction of haulage roads and fire breakers, account will be taken of the modification of the surface water flow; every effort will be made to ensure that the haulage roads are as straight as possible.

Adequate harvesting methods will be used depending on the forestry specie (*Acacia auriculiformis, Eucalyptus camaldulensis, Terminalia spp.*, etc.), the nature of the soil, the type of forestation (plantation, natural forest, etc.), the sylviculture characteristics (80 cm of stump, etc.). Buffer zones will be maintained between felled zones and total felling avoided (leave uncut enough trees to favour national regeneration either through gemination or shoots from stumps; replant if necessary). The development plans will comprise forest fire management programmes.

To prevent the destruction or modification of fauna habitats, the project will ensure that the works schedule takes into account the use of the territory by the fauna (migration, reproduction period). Other measures will include the preservation of the habitats of rare endangered species and the protection of known birthing and spawning zones. In order not to disturb known or potential archeological zones, the opening of new operating sites will be accompanied by searches on areas with potential archeological remains. During works, archeological surveys will be conducted on identified sites; care will be taken not to reveal the exact location of such sites to the public to avoid losses or vandalization.

Environmental Follow-up

The Benin Environmental Agency (ABE) will provide the environmental follow-up and ensure that the effective application of measures produces the expected results on the basis of pre-determined follow-up indicators. In line with existing legislation, a simplified environmental follow-up (évaluation environnemental simplifiée, ESS) will be conducted under ABE supervision to identify the corrective measures on the basis of which an environmental management plan (EMP) listing all potential negative impact attenuating measures will be prepared. The project implementation unit will be responsible for executing such measures. Budgetary allocations will be given for implementing the EMP and the environmental follow-up.

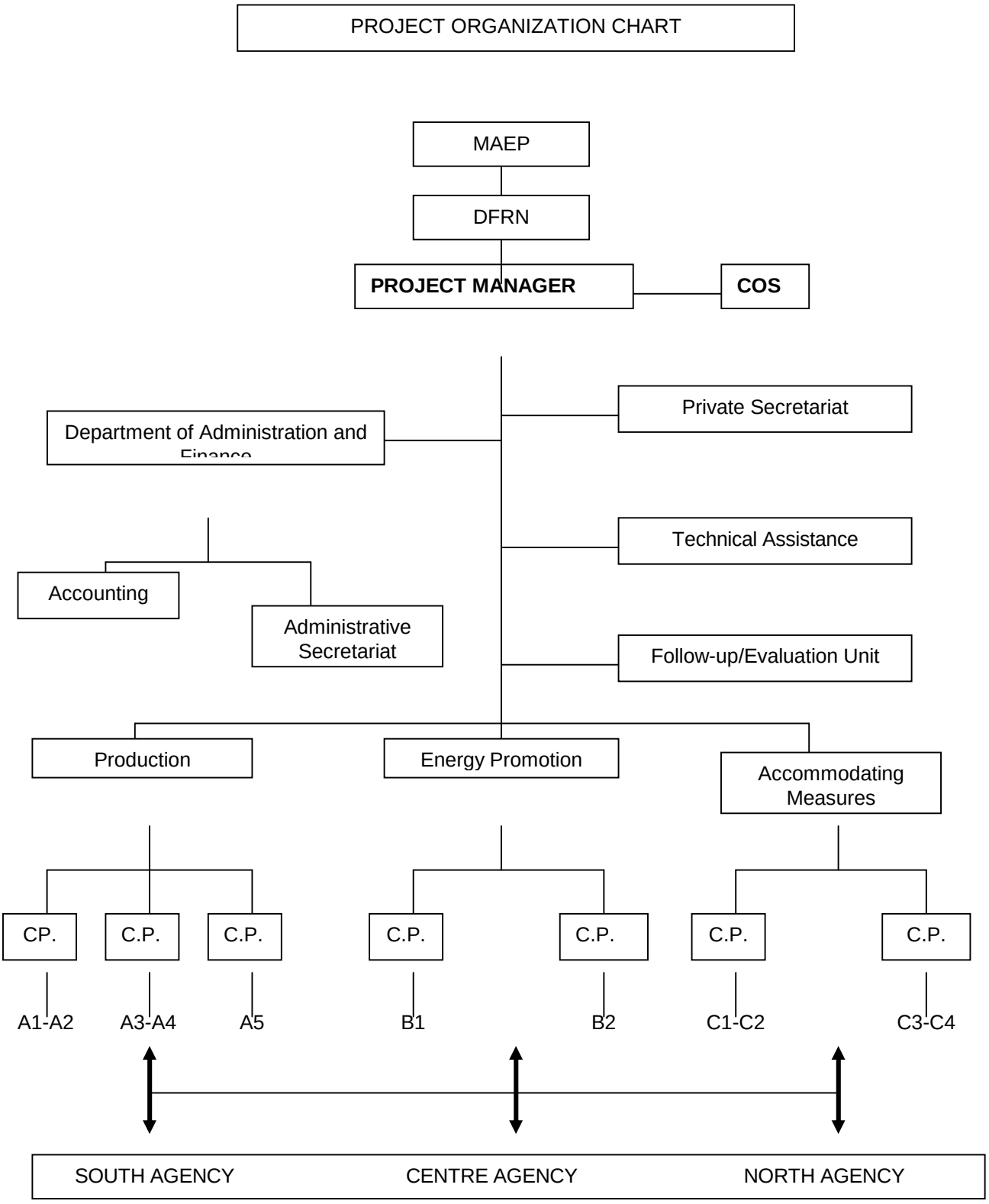
2. Institutional Framework: Benin Environmental Agency (ABE)

Established in 1995 by Presidential Edict, the Benin Environmental Agency is charged with coordinating the implementation of the national environmental policy. It plays a catalytic role in decision-making on environmental issues, and spearheads the implementation of the country's EAP (Environmental Action Plan). It is the Governments and civil society's instrument for appraising, monitoring, informing and proposing environmental corrective and follow-up measures. It is responsible for promoting better integration of environmental issues into sectoral policies and programmes, planning environmental impact assessment (EIA) and monitoring the implementation of recommendations from such assessment. An orientation committee presided by the Ministry in charge of the Environment is charged with coordinating and monitoring ABE activities. Comprising representatives drawn from ministries that have a considerable impact on the environment and the civil society, the said committee monitors ABE work programmes, promotes inter-sectoral coordination and sensitizes public entities on specific issues. Statutorily, it meets twice yearly or ad hoc, depending on what issues are to be discussed. The ABE Director maintains the committee's secretariat. The

committee mechanism is currently the tool that enables Benin not only to create and develop an adequate environmental management capacity but also to increasingly factor environmental considerations into all development issues.

Generalization of environmental impact assessment is founded on Benin's framework edict on the environment, underscored by principles of managing, promoting and protecting the environment through participatory involvement, environmental education, polluter responsibility, inter-generation equity and *a priori* control of activities potentially harmful to the environment. The distinguishing characteristic of the edict is its innovatory nature which emphasizes transparency and information by rendering environmental impact assessment accessible to the public. Thus, during the information and consultation phase which follows the investment project initiator's submission of the environmental impact to the Ministry in charge of the Environment, a public hearing is organized to enable the Government (or one of its agencies), promoters and other interested persons to give their opinion. The public hearing committee submits a report containing its recommendations to the Ministry. The recommendations, if necessary, might focus on the choice of variants, accommodating measure, etc. Ministerial authorization is only issued in the wake of technical opinion from the Benin Environmental Agency (ABE). Moreover, the framework edict comprises provisions on activities that may be authorized without an environmental impact assessment (e.g. urgent works to counter or reduce the impact of a catastrophe).

REPUBLIC OF BENIN
FIRE WOOD PROJECT – PHASE II (PBF-II)



A1= SDA, A2= Rural markets, A3 = State-owned and village/sub-sector forests; A4= Women; A5= Appropriate technologies; B1 = Private sector/substitution support; B2 = Improved stoves; C1 = IEC; C2 = Training; C3 = Regulation, fiscality, control reform; C4 = Data base (SIEP)

Annex 5

REPUBLIC OF BENIN
FIRE WOOD PROJECT – PHASE II (PBF-II)
CALCULATION OF THE INTERNAL ECONOMIC RATE OF RETURN
(in FCFA thousand)

Year	Nursery Margin	Private Plantation Production	Project Production	State Forest Production	Wood Production Value	Project Investment	Operations	Renewed Investment	Operating Expenditure	Private Installations & Operations	Total Cost	Cash Flow	H1 Cost +10%	H2 Income -10%
2002	17802	0	1680000	120400	1818202	2287028	698500		0	847493	3833021	-2014819	-2398121	-2196639
2003	551862	0	2800000	177520	3529382	2443010	1038590			1367710	4849310	-1319928	-1804859	-1672866
2004	645000	0	3360000	216160	4221160	1800457	1077119			1843360	4720936	-499776	-971870	-921892
2005	654288	0	3360000	200480	4214768	1892568	1151217			2549430	5593215	-1378447	-1937768	-1799924
2006	478848	0	2800000	53130	3331978	795782	863720	0	0	2892500	4552002	-1220024	-1675225	-1553222
2007	30960	0	0	151690	182650	0	0	0	147244	1319500	1466744	-1284094	-1430768	-1302359
2008	30960	301875	0	147070	479905	0	0	0	154606	1319500	1474106	-994201	-1141612	-1042192
2009	294120	433125	3360000	117810	4205055	0	0	0	170067	1319500	1489567	2715488	2566531	2294983
2010	303408	525000	5600000	82775	6511183	0	0	0	183672	1319500	1503172	5008011	4857694	4356893
2011	303408	682500	6720000	122045	7827953	0	0	0	196529	1319500	1516029	6311924	6160321	5529128
2012	303408	682500	6720000	148610	7854518	0	0	0	208321	1319500	1527821	6326697	6173915	5541245
2013	294120	0	5600000	137830	6031950	0	0	0	218737	1319500	1538237	4493713	4339889	3890518
2014	30960	201250	0	187495	419705	0	0	0	218737	1319500	1538237	-1118532	-1272356	-1160503
2015	30960	288750	0	200200	519910	0	0	0	218737	1319500	1538237	-1018327	-1172151	-1070318
2016	30960	350000	2310000	125895	2816855	0	0	264570	218737	1319500	1802807	1014048	833767	732362
2017	30960	455000	3850000	43470	4379430	0	0	291027	218737	1319500	1829264	2550166	2367240	2112223
2018	30960	455000	4620000	124110	5230070	0	0	320130	218737	1319500	1858367	3371703	3185867	2848696
2019	294120	0	4620000	120330	5034450	0	0	352143	218737	1319500	1890380	3144070	2955032	2640625
2020	294120	161000	3850000	96390	4401510	0	0	387357	218737	1319500	1925594	2475916	2283357	2035765
2021	294120	231000	0	67725	592845	0	0	387357	218737	1319500	1925594	-1332749	-1525308	-1392033
2022	294120	280000	0	99855	673975	0	0	387357	218737	1319500	1925594	-1251619	-1444178	-1319016
2023	294120	364000	1890000	121590	2669710	0	0	0	218737	1319500	1538237	1131473	977649	864502
2024	30960	364000	3150000	112770	3657730	0	0	0	218737	1319500	1538237	2119493	1965669	1753720
2025	30960	0	3780000	153405	3964365	0	0	0	218737	1319500	1538237	2426128	2272304	2029691
2026	30960	0	3780000	163800	3974760	0	0	0	218737	1319500	1538237	2436523	2282699	2039047
											ERR	18.82%	14.15%	13.70%