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Report No: PAD3317

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED CREDIT

IN THE AMOUNT OF EUR 178.5 MILLION
(US$200 MILLION EQUIVALENT)

TO THE

REPUBLIC OF CAMEROON

FOR THE

VALORIZATION OF INVESTMENTS IN THE VALLEY OF THE BENUE PROJECT

AUGUST 14, 2020

Agriculture and Food Practice
Western and Central Africa Region

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CURRENCY EQUIVALENTS

Exchange Rate Effective June 30, 2020

Currency Unit	Central African CFA Franc (XAF)
US$1 =	585.23339108
US$1 =	EURO 0.89218004

FISCAL YEAR
January 1 - December 31

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Country Director:	Abdoulaye Seck
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ABBREVIATIONS AND ACRONYMS

AFD	*Agence Française de Développement/*French Development Agency
AWD	Alternate Watering and Drying
BEAC	*Banque des États de l'Afrique centrale*/Bank of Central African States
BP	Business Plan
CAA	*Caisse Autonome d'Amortissement/*Autonomous Amortization Fund
CAADP	Comprehensive Africa Agriculture Development Program
CEMAC	Central African Economic and Monetary Community
CERC	Contingent Emergency Response Component
CF	Conversion Factor
CGERs	*Centres de Gestion Economique Rural/*Rural Economic Management Centers
CIA	Cumulative Impact Assessment
*CIT/*TIC	*Centre d'Innovation Technologique/*Technical Innovation Center
CNPC-C	*Confédération Nationale des Producteurs de Coton du Cameroun/*National Confederation of Cotton Producers of Cameroon
COVID-19	Corona Virus Disease, 2019
CPF	Country Partnership Framework
CRPA	*Centre Régionale d'Appui à la Professionnalisation Agricole/*Regional Support Center for Agricultural Professionnalisation
CSA	Climate-Smart Agriculture
DA	Designated Account
DPO	Development Policy Operation
DPU	Declaration of Public Utility
DS	Dry Season
DSCE	*Document de Stratégie pour la Croissance et l'Emploi/*Growth and Employment Strategy Document
DSDSR	*Document de Stratégie de Développement du Secteur Rural/*Rural Development Strategy
E&S	Environmental and Social
EFA	Economic and Financial Analysis
EHS	Environmental Health and Safety
ENEO	Name of public-private partnership company that produces and distributes energy in Cameroon
EPP	Emergency Preparedness Plan
EPT	Evapotranspiration
ERP	Emergency Response Preparedness
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
EX-ACT	Ex-Ante Carbon Balance Tool
FAO	Food and Agriculture Organization
FCFA	CFA Franc
FI	Financial Intermediaries

FM	Financial Management
FRR	Financial Rate of Return
GBV	Gender-based Violence
GDI	Gender Development Index
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIE/CIG	*Groupe Intérêt Economique*/Common Interest Group
GIIP	Good International Industry Practice
GIS	Geographic Information System
GoC	Government of Cameroon
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GRST	*Groupe Régional du Suivi et Technique*/Regional Monitoring and Technical Group
GS	General Secretariat
Ha	Hectare
HDI	Human Development Index
HEIS	Hands-on Expanded Implementation Support
Hr	Hour
HVC	Higher Value Crop
I&D	Irrigation and Drainage
ICR	Implementation Completion and Results Report
IDA	International Development Association
IFDC	International Fertilizer Development Center
IMF	International Monetary Fund
IRAD	Institute of Agricultural Research for Development
LB	Left Bank
LBIS	Left Bank Irrigation Scheme
LLL	Laser Land Levelling
KPI	Key Project Indicators
M&E	Monitoring and Evaluation
masl	Meters above sea level
MEADEN	*Mission d'Etudes pour l'Aménagement et le Développement de la Province du Nord/*Mission for the Development of the North Province
MEAVSB	*Mission d'Etudes et d'Aménagement Régional de la Vallée Supérieure de la Bénoué*/Mission of Studies and Regional Planning of the Upper Benue Valley
MFD	Maximizing Financing for Development
MINADER	*Ministère de l'Agriculture et du Développement Rural/*Ministry of Agriculture and Rural Development
MINDCAF	*Ministère des Domaines, du Cadastre et des Affaires Foncières/*Ministry of Lands
MINEE	*Ministère de l'Eau et de l'Energie*/Ministry of Water and Energy
MINEFI	*Ministère de l'Économie et des Finances/*Ministry of Economy and Finance
MINEPAT	*Ministère de l'Economie, de la Planification et de l'Aménagement du Territoire/*Ministry of Economy, Planning and Regional Development
MINEPDED	*Ministère de l'Environnement, de la Protection de la Nature et du Développent Durable*/Ministry of Environment, Nature Protection and Sustainable Development

MINMAP	*Ministère des Marchés Publics*/Ministry of Public Procurement
MINTP	*Ministère des Travaux Public*/Ministry of Public Works
MoU	Memorandum of Understanding
MW	Megawatt
NBA	Niger Basin Authority
NDC	Nationally Determined Contribution
NGO	Non-governmental Organization
NPF	New Procurement Framework
NPV	Net Present Value
O&M	Operations and Maintenance
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
OP/BP	World Bank Operational Policies/Bank Procedures
PACA	*Projet d'Amélioration de la Compétitivité Agricole*/Agricultural Competitiveness Improvement Project
PAP	Project-affected People
PDO	Project Development Objective
PIDMA	*Projet d'Investissement et de Développement des Marchés Agricoles/*Agriculture Investment and Market Development Project
PIE	Project Implementation Entity
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PLL	Precision and Land Leveling
PMP	Pest Management Plan
PNDP	*Programme National de Développement Participatif*/Community Development Program Support Project
PNIA	*Plan National d'Investissement Agricole/*Agriculture National Investment Plan
PP	Procurement Plan
PPA	Project Preparation Advance
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
PTBA	*Plan de Travail et du Budget Annuel/*Annual Work Plan and Budget
PULCI	*Projet d'Urgence de Lutte contre les Inondations/*Flood Emergency Project
R&D	Research and Development
RAP	Resettlement Action Plan
RB	Right Bank
RBIS	Right Bank Irrigation Scheme
RF	Results Framework
RFB	Request for Bidding
RPF	Resettlement Policy Framework
SAED	*Société Nationale d'Aménagement et d'Exploitation des Terres/*National Society for Land Improvement and Development
SCD	Systematic Country Diagnostic
SEAH	Sexual Exploitation, Abuse, and Harassment
SEMRY	*Société d'Expansion et de Modernisation de la Riziculture de Yagoua*/Yagoua Rice Development Company

SIGED	*Système Intégré de Gestion des Décaissement/*Integrated system for Managing Disbursements
SME	Small and Medium Enterprise
SOP	Series of Projects
SRI	System of Rice Intensification
STEP	Systematic Tracking of Exchanges in Procurement
TA	Technical Assistance
ToR	Terms of Reference
TRIMING	Transforming Irrigation Management in Nigeria
US$	United States Dollar
VIVA	Valorization of Investments
WP/WoP	With Project/Without Project
WS	Wet Season
WUA	Water User Association
WUA/CGERH	Management and Maintenance Committees of the Hydraulic Network
XAF	Central African CFA Franc
ZIC	*Zones d'intérêt cynégétique*/Hunting Area

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DATASHEET

BASIC INFORMATION

Country	Project Name
Cameroon	Valorization of Investments in the Valley of the Benue

Project ID	Financing Instrument	Environmental Assessment Category
P166072	Investment Project Financing	A-Full Assessment

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[✓] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
04-September-2020	30-June-2027

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To provide sustainable irrigation and drainage services and improve agricultural production in irrigated areas of the Benue valley

Components

Component Name	Cost (US$, millions)

1.	Improvement of Infrastructure and Water Management	166.90
2.	Support Services for Agricultural Production	61.10
3.	Capacity Building and Implementation	33.00
4.	Contingent Emergency Response Component C	

Organizations

Borrower:	REPUBLIC OF CAMEROON
Implementing Agency:	MEADEN (*Mission d'Etudes pour l'Aménagement et le Développement de la Province du Nord*)

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	261.00
Total Financing	200.00
of which IBRD/IDA	200.00
Borrower	7.00
Local Beneficiaries	54.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	200.00
IDA Credit	200.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Cameroon	200.00	0.00	0.00	200.00
National PBA	200.00	0.00	0.00	200.00

Total	**200.00**	**0.00**	**0.00**	**200.00**

Expected Disbursements (in US$, Millions)

WB FY	2020	2021	2022	2023	2024	2025	2026	2027
Annual	3	9	30	51	52	38	12	5
Cumulative	3	12	42	93	145	183	195	200

INSTITUTIONAL DATA

Practice Area (Lead)

Agriculture and Food

Contributing Practice Areas

Environment & Natural Resources, Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	High
2. Macroeconomic	High
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	High
7. Environment and Social	High
8. Stakeholders	Substantial
9. Other	Substantial
10. Overall	High

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [X] No

Does the project require any waivers of Bank policies?

[ ] Yes [X] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36	✓	
Pest Management OP 4.09	✓	
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37	✓	
Projects on International Waterways OP/BP 7.50	✓	
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Covenants

(1) **FA Schedule 2, Section I.A.1:** The Recipient shall establish by no later than six (6) months after the Effective Date, and thereafter maintain at all times during the implementation of the Project, a Project Steering Committee, chaired by a senior representative of MINEPAT, and with terms of reference, composition, powers, functions, staffing, facilities and other resources satisfactory to the Association.

(2) **FA Schedule 2, Section I.A.2:** The Recipient shall establish by no later than six (6) months, and thereafter maintain at all times during the implementation of the Project, a Regional Technical Monitoring Team chaired by the Governor of the Recipient's North Region, and with terms of reference, composition, powers, functions, staffing, facilities and other resources satisfactory to the Association.

(3) **FA Schedule 2, Section I.A.3(a):** The Recipient shall establish, by no later than four (4) months after the Effective Date, and thereafter maintain at all times during the implementation of the Project, a Project

Implementation Unit ("PIU") within MEADEN, withterms of reference, composition, powers, functions, staffing, facilities and other resources satisfactory to the Association.

(4) **FA Schedule 2, Section I.A.3(b):** Without limiting the foregoing, the PIU shall include, inter alia, a Project Coordinator, a financial management specialist, a procurement specialist, an accountant, an internal auditor, a monitoring and evaluation specialist, an environmental specialist, a social specialist, a gender specialist; all such staff to be appointed by no later than four (4) months after the Effective Date, and all with qualifications, experience and terms of reference acceptable to the Association.

(5) **FA Schedule 2, Section I.A.4:** The Recipient shall (a) not later than three (3) months after Effective Date, establish and operationalize a special tender board for the Project in line with the Recipient's procurement regulations, to be responsible for overseeing the review of procurement documentation related to the Project; and (b) in the event of a need for tender reviews prior to the establishment of the said special tender board, cause the internal tender board of MEADEN to assume responsibility for such reviews until such time as the special tender board is established, in a manner acceptable to the Association.

(6) **FA Schedule 2, Section I.B.1(b):** The Recipient shall, by no later than two (2) months after the Effective Date prepare and adopt a Project procedures manual, containing detailed guidelines and procedures for administrative, financial management, and disbursement, and other fiduciary matters under the Project, in form and substance acceptable to the Association.

(7) **FA Schedule 2, Section I.B.1(c):** The Recipient shall, by no later than two (2) months after the Effective Date prepare and adopt a monitoring and evaluation manual, containing detailed guidelines and procedures for monitoring and evaluation matters under the Project, in form and substance acceptable to the Association.

(8) **FA Schedule 2, Section I.B.2(b):** The Recipient shall no later than November 30 of each year, furnish the draft annual work plan and budget for the following year to the Association for its review, and promptly thereafter finalize the draft annual work plan and budget, taking into account the Association's comments thereon; provided, that for the first year of Project implementation, the Recipient shall furnish the draft annual work plan and budget by no later than one (1) month after the Effective Date.

(9) **FA Schedule 2, Section I.C.1:** The Recipient shall, through MEADEN and MINEPAT (as applicable), no later than six (6) months after the Effective Date, prepare a draft, finish and adopt the reorganization plan for MEADEN.

(10) **FA Schedule 2, Section I.C.2:** The Recipient shall ensure that the implementation of the MEADEN Reorganization Plan is completed by no later than thirty-six (36) months after the Effective Date, or such later date as may be agreed by the Association in writing.

(11) **FA Schedule 2, Section I.D.1:** The Recipient, through MINADER shall by no later than 12 months after the effective date, and in any event by no later than the date on which the irrigation schemes are transferred to the Water Users Associations, prepare and adopt a Ministerial Decision setting forth rules for the management of irrigation schemes.

(12) **FA Schedule 2, Section I.D.2:** The Recipient, through MEADEN, shall, by no later than 18 months after the effective date, and in any event by no later than the date on which irrigation schemes developed under Part 1.2 of the Project are transferred to the Water Users Associations, prepare and adopt a management code for each of the irrigation schemes developed on the left bank and right bank of the Benue river.

(13) **FA Schedule 2, Section I.H.2(c)(B):** The Recipient shall prepare and disclose a Labor Influx Management Plan by no later than 6 months after effective date.

(14) **FA Schedule 2, Section I.H.2(c)(A):** The Recipient shall prepare and disclose a Stakeholder Engagement Plan by no later than 3 months after effective date.

(15) **FA Schedule 2, Section I.I.1:** The Recipient shall, by no later than March 31, 2021, the Recipient shall establish and, thereafter maintain throughout Project implementation, an independent panel of experts, in form and with terms, composition and resources acceptable to the Association, for the purpose of reviewing and advising the Recipient on matters related to safety and other critical aspects of Lagdo Dam.

(16) **FA Schedule 2, Section I.I.2(a):** The Recipient shall, by no later than October 31, 2020, develop a time-bound action plan for the implementation of the recommendations of the Dam Safety Assessment Report (including terms of reference and a time-bound action plan for the carrying out of a hydrological and hydraulic study and for the carrying out of periodic safety inspections), in form and substance acceptable to the Association (the "Dam Safety Action Plan"), and adopt and implement, or cause to be implemented such action plan in a manner acceptable to the Association.

(17) **FA Schedule 2, Section I.I.2(b):** The Recipient shall, by no later than January 30, 2026, in accordance with terms of reference acceptable to the Association: (i) prepare, or cause to be prepared, an updated operation and maintenance plan, instrumentation plan and emergency preparedness plan for Lagdo Dam (the "Dam Safety Plans"), based on the recommendations of the Dam Safety Assessment Report; (ii) furnish said plans to the Association for its review; (iii) adopt and implement, or cause to be implemented, said plans, taking into account the views of the Association on the matter, and all in a manner and in form and substance acceptable to the Association.

(18) **FA Schedule 2, Section II.B(a):** The Recipient shall carry out jointly with the Association, not later than forty-two (42) months (or such other period as may be agreed with the Association) after the Effective Date, a midterm review to assess the status of Project implementation.

Disbursement Conditions

FA Schedule 2, Section III.B.1: No withdrawal shall be made:

(a) under Category (2) until the Recipient has prepared and adopted the Final ESIA/ESMP in form and substance acceptable to the Association, and the Association has confirmed that civil works under Part 1.2 of the Project may be commenced, all in accordance with the provisions of Section I.H.2 of Schedule 2 to the Financing Agreement;

(b) under Category (4) for e-Vouchers, until the Recipient has adopted the e-Voucher Manual, in form and substance acceptable to the Association, and in accordance with the provisions of Section I.E. of Schedule 2 to thee Financing Agreement;

(c) under Category (5) for Matching Grants, until the Recipient has adopted the Matching Grants Manual, in form and substance acceptable to the Association, and in accordance with the provisions of Section I.F of Schedule 2 to the Financing Agreement;

(d) under Category (6) for Scholarships, until the Recipient has adopted the Scholarship Manual and at least one (1) Scholarship Agreement with an Eligible Institution, all in form and substance acceptable to the Association, and in accordance with the provisions of Section I.G of Schedule 2 to the Financing Agreement.

I. STRATEGIC CONTEXT

A. Country Context

1. **A lower middle-income country of about 24 million people, Cameroon is strategically located on the Gulf of Guinea.** With a per capita Gross Domestic Product (GDP) of US$1,534 (current prices) in 2018 the economy is largely driven by its primary sectors, agriculture and mineral resources, and benefits from its location in the Congo Basin, the world's second largest tropical forest zone, which provides an exceptional ecological diversity. Despite having one of the most diversified economies in the Central African Economic and Monetary Community (CEMAC) region, Cameroon's economic activity real GDP growth slowed slightly in 2019 as compared to 2018 (4.0 percent versus 4.1 percent respectively)[1] due to the decline in the labor-intensive agriculture and agribusiness sectors affected by socio-political crisis in the anglophone regions (North West and South West).

2. **The global crisis related to the COVID-19 pandemic has negatively affected Cameroon's economy, which is projected to contract by 3.5 percent in 2020** (by 4.6 percent in per capita terms), compared to a pre-crisis projection of 4.2 percent growth**.** The crisis has impacted Cameroon's economy primarily through lower global demand and lower prices for the country's main export commodities (oil, coffee, cocoa, cotton, aluminum, and rubber) as well as through severe contractions in the hospitality and transport sectors. As a result of lower revenues, the fiscal deficit is projected to widen to 4.6 percent of GDP in 2020 from 2.2 percent in 2019. In addition, tighter external financial conditions have reduced access to credit for all types of enterprises. In this context, the poverty rate and poverty depth are expected to increase as a result of job and income losses combined with higher food prices linked to disruptions in supply chains. While considerable uncertainty exists in the economic outlook, the economy is projected to rebound by 4 percent on average per year in 2021-2023, with the fiscal deficit narrowing to 2.8 percent of GDP by 2022.

3. **The Government of Cameroon's (GoC's) long-term vision, *Cameroon Vision 2035*, is of an emerging, democratic and united and diverse country.** To operationalize this Vision, the Government adopted a Growth and Employment Strategy Document *(Document de Stratégie pour la Croissance et l'Emploi, DSCE)* in 2009 and defined specific objectives to be achieved by 2020, including to reduce poverty to less than 29 percent, and to 10 percent in 2035. The GoC has further adopted the United Nations 2030 Agenda for Sustainable Development. It has also endorsed the Paris Agreement under the United Nations Framework Convention on Climate Change and published Cameroon's Nationally Determined Contributions (NDC), setting out its contribution to climate change mitigation and priorities for adaptation. The NDC includes a focus on the intensification of environmentally sustainable agricultural practices.

4. **Cameroon has been grappling with attacks by Boko Haram in the Far North and a secessionist insurgency in the Anglophone regions**. The North-West South-West crisis is a conflict between non-state armed groups and the Cameroonian army. Since September 2017, this crisis has displaced more than 600,000 people internally and claimed the lives of close to 600 people. There is also an influx of refugees from the Central African Republic (CAR) in the eastern area of Cameroon and in the Eastern, Adamawa, and Northern Regions. Due to Boko-Haram attacks, there is also a refugee influx from Nigeria. Figures from the United Nations Refugee Agency (UNHCR) show that Cameroon is currently, as of June 30, 2020, hosting over 414,852 refugees, primarily from the CAR and Nigeria. Security operations on the borders and in the North West and South West are expected to drive public expenditure up in 2020 and beyond. Internally Displaced Persons were

[1] Source: World Bank data.

estimated at 679,393; protecting them and the refugees from the Coronavirus disease (COVID-19) will be particularly challenging.

5. **The DSCE identifies inadequate infrastructure and an unfavorable business environment as the main factors impeding economic growth and employment creation.** The agriculture sector, which currently employs about 70 percent of the active population in Cameroon (primarily in the informal sector), is regarded as the engine for economic growth and job creation if it can be transformed from traditional to diversified and commercially viable farming (see below). The DSCE recognizes the need for agricultural diversification, increased productivity, and large-scale public investment projects in the sector. In fact, notwithstanding Cameroon's abundance of natural assets and tremendous climatic and land potential, the primary sector's contribution to growth is limited, about one percentage point of GDP annually, and it is dominated by food crops grown by smallholder farmers.

6. **As population growth outpaces poverty reduction, the number of people below the poverty line increased in the Northern regions** which exhibit by far the highest poverty rates in Cameroon, with an estimated 56 percent of the poor living in the North and Far North regions alone. In these two northern regions, poverty and inequality levels have steadily increased over time relative to the rest of the country where poverty and inequality have declined. Poverty and inequality are subject to multiple traps, which are documented extensively in the World Bank Systematic Country Diagnostic (SCD, Report 103098-CM)[2], including low agriculture productivity, increasing vulnerability to climate change, poor infrastructure, and limited access to health and education services.

7. **At the national level poverty is being reduced, but the population growth rate is limiting the success of such reduction.** During the period 2001 to 2014, national poverty has reduced from 40 to 37 percent. The most threatened regions are the North, where the project is located and where poverty increased from 50 to 69 percent, and the Far North where the poverty increased, during the same period, from 54 to 76 percent. National population density (inhabitants/km^2) is around 49, and in the Far North attains 111.

8. **Poverty incidence is correlated with agroecological zones.** The northern regions of Cameroon, i.e., the four poorest regions (the Far-North, the North, the North-West, and the Adamawa), belong to three agroecological zones – the Sudano-Sahelian, the Western Highlands, and the Guinea Savannah zones which together account for 80 percent of all poor. In the largely arid Sudano-Sahelian zone, comprising the Far North and North regions, agricultural output (millet, maize, peanuts, and cotton) depends heavily on rainfall. Animal production is also vulnerable to drought. In this zone, 72 percent of the population lives below the poverty line, while malnutrition is rampant with three out of four food insecure people located in the North and Far North regions. Nationwide, female-headed households are more vulnerable to food insecurity (18 percent versus 15 percent of male-headed households) and especially the single-headed households in rural areas (27 percent versus 22 percent of those with two members or more).

9. **Regarding the agricultural sector, the adopted measures against COVID-19, such as closing land borders with neighboring countries, has resulted in the blocking of trade with neighboring countries, disruption of urban markets, and losses of products that could not reach their destination**. Likewise, the suspension of incoming and outgoing flights has had a strong impact on exports of fresh products, and the reduction in demand for agricultural products. The Government through Ministry of Agriculture and Rural Development (*Ministère de l'Agriculture et du Développement Rural,* MINADER), is preparing a response plan that will have a short-term focus, from August to December 2020, and a medium-term one from January to

[2] Republic of Cameroon: Priorities for Ending Poverty and Boosting Shared Prosperity, June 20, 2016.

December 2021. The project is fully aligned with the principle of the response plan which focuses on subsidies to protect the affected farmers.

B. Sectoral and Institutional Context

10. **Agriculture remains the backbone of Cameroon's economy, employing 70 percent of its workforce, while providing 42 percent of its GDP and 30 percent of its export revenue.** Food crops contribute 64 percent to agricultural GDP, followed by livestock (13 percent), forestry (9 percent), industrial and export crops (8 percent), and fisheries (6 percent). About 54 percent of all households have at least one member who owns a crop field of about 2.4 hectares (ha) as documented in the DSCE.

11. **Yet, a series of constraints have led Cameroon's agriculture sector to be characterized by low productivity and low-production subsistence farming, especially in the North and Extreme North.** Declining soil fertility, limited use of fertilizer, low adoption of high-yielding varieties and improved farming techniques are among the core reasons for low yields. Techniques and approaches to address these constraints exist, and Cameroon has a number of high-quality agricultural research institutions. Nevertheless, the adoption of improved practices remains limited; no functional extension system is in place as evidenced by the size of the yield gaps.

12. **Despite the many challenges it faces, the GoC is committed to increasing investment in the agriculture sector for poverty reduction and economic growth.** A growth strategy that focuses on products cultivated by the poorest has a greater likelihood of successful poverty reduction. As the majority of the poor can be found in the rural areas of northern Cameroon, a poverty reducing growth strategy would need to focus on the value chain development of coarse grains (rice, maize, millet, and sorghum), but also livestock, as well as beans and cotton, which are the main cash crops grown in the Northern regions. In this context, the GoC's agriculture strategy is expressed in three key national strategy and planning documents: (i) «Vision 2035» envisages agricultural growth beyond 5 percent by 2029; the DSCE foresees significant productivity increases in agriculture and livestock farming; (ii) the 2009 Rural Development Strategy and its 2013 update (*Document de Stratégie de Développement du Secteur Rural*, *DSDSR)* commit to the modernization of rural infrastructure, agricultural production, and sustainable management of natural resources; and (iii) Cameroon has engaged in the African Union's Comprehensive Africa Agriculture Development Program (CAADP), and with CAADP support, Cameroon is currently finalizing its update of the 2014-2020 National Agriculture Investment Program *(Plan National d'Investissement Agricole, PNIA).*

13. **Irrigation development and management in Cameroon has not evolved since the 1980s, contrary to other countries in the region**. There is still no institutional framework for water users associations (WUAs), and the state-owned enterprises (*Société d'Expansion et de Modernisation de la Riziculture de Yagoua,* (SEMRY) in the Far North and *Mission d'Études pour l'Aménagement et le Développement de la Province du Nord* (MEADEN) in the North) do the work of the farmers: from land preparation to rice commercialization passing through irrigation service delivery. The results are poor at best, e.g., in the Far-North, they are only able to harvest in the irrigated area once per year (i.e., crop intensity is barely 1).

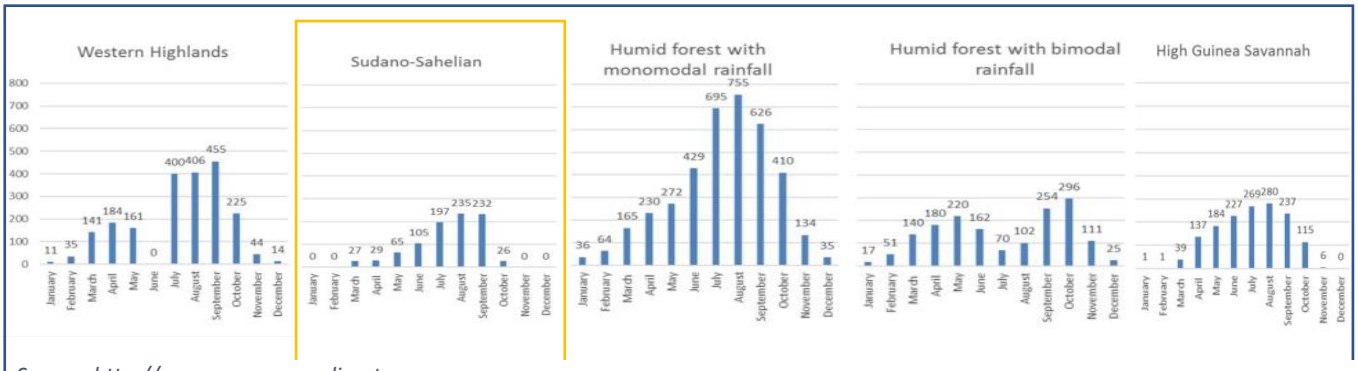
14. **At the national level, a new irrigation strategy/policy is being prepared by the Government along four main axes:** (i) irrigation development and rehabilitation with a progressive transfer of the operation and maintenance of irrigation schemes to the irrigation WUAs; (ii) transfer of the land preparation services to the private sector; (iii) promotion of the private sector in the commercialization of agricultural value chains (e.g., rice); and (iv) review of the role of the Government, particularly parastatal agencies, such as the (MEADEN).

15. **Irrigation is fundamental to ensuring regional food security in the North.** The Sudano-Sahelian agroecological zone is the most environmentally fragile and vulnerable to climate shocks of the five zones in

Cameroon. The North region has an average annual precipitation (P) of 800 mm, mostly from May to September, and the potential evapotranspiration (EPT) is 2,500 mm per year (P/EPT). This permanent EPT deficit translates into water stress and reduced photosynthesis and therefore lower yields. This high level of EPT implies higher climate risks. In this region, poverty increased from 56 percent in 2001 to 68 percent in 2014, indicating both the severity and a worsening trend of poverty. The region is highly populated and environmentally degraded and is subject to ongoing immigration pressure due to the socio-political destabilization in the border areas with North East Nigeria, Chad, and Niger. Most households rely on rainfed farming for food provisioning but are particularly vulnerable to climate change in the Sahelian context. More than half of households spend above 40 percent of their income on food purchases, and more than 15 percent are vulnerable to food insecurity. In this zone, improved irrigation is critical to increasing food availability, diversity, and affordability for poor households.

16. **The Benue hydro-system plays an important role in the resilience of vulnerable communities, livelihoods and ecosystems, including their capacity to better cope with and adapt to the impact of climate shocks and stressors**. The project area covers part of the Benue River Valley located in the North Cameroon Administrative Region. The Benue River Valley is one of the poorest regions in the country, highly populated, and with a history of immigration pressure from the Extreme North, and the North region. It lies within the Sudano-Sahelian Savanah agroecological zone. Of the five agroecological zones of Cameroon, the Sudano-Sahelian (North and Extreme North) is the one with the shortest rain-fed season (March to September, Figure 1 below). Building resilience in the basin is key to foster shifts in social or economic activities and behaviors needed to respond effectively to climate pressures. [3] The project constitutes an opportunity to change the relationship among different stakeholders (institutions, farmers associations, educational institutions, service providers, etc.).

Figure 1: Rainfall Patterns in Different Agroecological Zones in Cameroon: The Sudano-Sahelian Zone (in the yellow frame) is the one with the Shortest Season, and with the least Amount of Precipitation



Source: http://www.cameroon.climatemps.com

17. **In this zone, improved water storage, water harvesting, and irrigation are critical to improving farm production.** Improved water management also enhances the ability to withstand climatic shocks and is in line with a strategy whereby the production of staples is promoted in rainfed systems and production of high-value cereals (e.g. rice), horticultural crops, and industrial crops in irrigated systems. With an enormous untapped potential for irrigation (the 5,900 million m^3 Lagdo reservoir), the development of the Benue Valley, if correctly planned and implemented, will have a significant impact on improving the life of hundreds of thousands of

[3] World Bank 2017. "Climate Resilience in Africa: The role of cooperation around transboundary waters" World Bank, Washington, DC.

people.

18. **The Lagdo Reservoir impounded behind the Lagdo Dam provides water for power generation and irrigation of lands located immediately below the dam on both banks of the river, and is designed to provide flood modulation as well.** The Lagdo multipurpose dam was constructed on the Benue River over the years 1978-1982. At completion, the storage volume in the reservoir impounded behind the dam was about 7,700 million cubic meters (m3), with an allocation of 400 million m3 for irrigation. The lake is also a resource for fisheries. A hydropower plant was established with 72 MW installed capacity, and plans were made for the development of irrigation downstream (Master Plan of Irrigation in the Benue river valley for 17,000 ha, of which 11,000 ha can be irrigated from the dam)[4]. The hydropower station has been operating since 1982, but the irrigation development did not take place as originally envisaged: only 200 ha were developed in 1987-89 and 800 ha during 1992-1993 on the right bank (RB). The current irrigated area has barely 600 ha of functional irrigation and is fundamentally operated by MEADEN (full canal operation, land preparation for more than 90 percent of the land) without maintenance or irrigation fee recovery, and the system is in poor condition.

19. **The Water Management Committee of Lagdo dam (*Comité de Gestion de l'Eau du Barrage de Lagdo*) was created in 2015 but has never been operationalized.** This is particularly important for managing the multi-purpose nature of the asset. This Committee has allocation capabilities for every large user (RBIS-Lagdo, LBIS-Lagdo, ENEO, water supply, release of excess water, and others) for the dry season (DS) based on the water level at the end of every rainy season. In addition, there is a Coordination Committee between Cameroon and Nigeria for integrated water resources management; the improvement of information in the basin will improve the decision-making process of this Coordination Committee.

20. **Management of the Benue River Valley development process is faced with numerous challenges.** The Agency for the Development of the North Region *(Mission d'Etudes pour l'Aménagement et le Développement de la Région du Nord, MEADEN)*, is the primary institution responsible for the strategic vision for the development of the North, reporting to Ministry of Economy, Planning, and Regional Development, (*Ministère de l'Economie, de la Planification et de l'Aménagement du Territoire*, MINEPAT). It is a parastatal organization responsible for the Benue River Valley development. When MEADEN was established in 1972, the operation and maintenance of the hydraulic infrastructure of the Lagdo reservoir was its core mandate. During the 1990s, the mandate to operate and maintain the large infrastructure of the Lagdo reservoir was transferred to the Government, under the MINEPAT. MEADEN has since then focused only on the operation of the irrigation services, along with agricultural support and land-preparation services. The main strengths of MEADEN are: (i) its long-established local presence and local development experience; (ii) qualified technical personnel; (iii) the well-organized data base and library; and (iv) the ownership of several high-quality development studies, many carried out by top notch consulting engineering firms. On the other hand, MEADEN is understaffed at many levels, and is not geared toward project implementation.[5] A severe lack of mechanization in the area, and a near-complete absence of explicit rules for land-access and control and irrigation water management, are key issues to be addressed. The present multiple roles originate from historical evolutions that have entrenched a highly centralized bureaucratic character of the organization, which requires transformation.

[4] Provision was made in the original design of the Lagdo Dam Complex to provide irrigation water (400 million m3) to irrigate lands situated on both banks of the river immediately downstream. Original designs allowed for gravity irrigation of about 6,000 ha on the RB and about 5,000 ha on the LB. However, only limited irrigation infrastructure was built along the RB, covering about 1,000 ha of which only 600 ha can presently be irrigated. No infrastructure, including water intake, was built on the LB.

[5] MEADEN has a modest staff contingent of 40 personnel, machinery workshops and stores, machinery, and a fleet of trucks. Its budget for 2018 was a mere US$0.5 million, barely sufficient to cover the cost of staff.

21. **Women are particularly affected by poverty and climate change as gender disparities in Cameroon are stark.** Women experience inequality in access to health, education as well as command over economic resources resulting in a Gender Development Index (GDI)[6] value of 0.853. That places Cameroon among the countries with the lowest rates of equality in Human Development Index (HDI) between women and men. Among the rural population in Cameroon, 73 percent of women work in agriculture (principally in the informal sector), but only 22 percent have rights to land (19 percent in the North). This is despite the existence of laws favorable to female ownership. The unequal distribution of land between men and women is rooted in a patriarchal system. The inequality of relations of power between men and women weighs heavily on the ability of women to access resources. Women are also (i) less educated than men and have less information regarding land ownership laws and regulations - 32 percent of women in Cameroon have secondary education (40 percent for men); 18 percent of girls in the North are enrolled in secondary education (36 percent of boys); and (ii) economically weak and do not always have access to resources to register land. Even though women play a key role in the rural economy and in food security, there is a lack of data disaggregated by gender, and thus women's contribution to the rural economy is often ignored or at best underestimated. Climate change adds to the burden on women who have to spend more time collecting wood or water, often walking far from home and risking physical and sexual violence. The prevalence of Gender-based Violence (GBV) in Cameroon is much higher than the regional average -- 55 percent country-wide and 60 percent in the North.

C. Relevance to Higher-Level Objectives

22. **The project is fully consistent with the Cameroon Country Partnership Framework (CPF) for 2017-2021** (presented to the Board of Executive Directors on February 28, 2017, Report no. 107896-CM) and the Program Learning Review (reviewed by the Board on July 30, 2019, Report no. 137218-CM). The CPF suggests that in the short-term, the largest opportunity for increasing shared prosperity and reducing acute poverty in Cameroon is an improvement in rural livelihoods, largely based on agriculture. This is because 85 percent of all poor people live in the countryside, the vast majority in the Sudano-Sahelian areas of the North and the Far North regions. While Cameroon has a strong potential to increase agriculture productivity, it is a net importer of food, especially rice, currently producing only about a fifth of its needs. The CPF also points at regional integration as a critical catalyst for growth, and puts special attention to building institutional and technical capacity to help the GoC to become a leader in climate adaptation measures for water resources management, thereby benefitting its neighboring countries in terms of water availability, flood control, food security, and social stability.

23. **The proposed project addresses the in-country issues identified in the CPF and promotes irrigation, improvements in agricultural practices, and agriculture livelihoods under an integrated approach**. Irrigation will be expanded from reservoirs already developed on the Benue River, which would help safeguard against climate change impacts and increased occurrence of droughts. The supporting project components are aligned to the development and dissemination of new agricultural technologies, climate-resilient agriculture, and enhanced market linkages for small and marginal farmers. Further, the project will have positive impacts in terms of environmental protection and reduced greenhouse-gas emissions by disseminating high-efficiency irrigation systems, which significantly reduce water consumption. The proposed project would also improve the sustainability and reliability of rainfed agriculture and small-scale irrigated agriculture in the Benue River Valley downstream of the Lagdo dam, such as in Nigeria, with better flood protection features.

24. **The proposed project will contribute to Maximizing Financing for Development (MFD) by promoting the role of the private sector in key areas and optimizing the use of scarce public resources**. Cameroon's rice subsector has a strong potential for growth if the value chain, and especially local processing, can improve.

[6] GDI= Gender Development Index. For more information see http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/CMR.pdf

This project will help promote private sector participation (PSP) in key areas where it has a clear value added and where the MEADEN operated so far with low results. The areas where PSP is expected include: (i) in the preparation of land, which requires precision land levelling (PLL) and a high level of mechanization that can only be offered by private operators; (ii) in milling, where several small operators already stand ready to operate if the Yagoua Rice Development Company *(SEMRY)* would recognize their legitimacy; and (iii) all along the chain of commercialization (transformation, packaging, transport, marketing).

25. **Links with other existing projects.** The proposed project builds on the experience of the Flood Emergency Project (*Projet d'urgence de lutte contre les inondations*, PULCI, P143940) for Components 1, 2, and 3, the Agriculture Investment and Market Development Project (*Projet d'Investissement et de Développement des Marchés Agricoles*, PIDMA, P143417), as well as the Cameroon Transport Sector Development Project (P150999) for Component 2. PULCI, following previous work from the Agricultural Competitiveness Improvement Project (*Projet d'Amélioration de la Compétitivité Agricole*, PACA, P112635), is working to improve irrigation and flood protection in a sustainable manner for the riverine population of the Far North. Furthermore, the World Bank is currently supporting the preparation of Cameroon's Climate Smart-Agriculture Investment Plan, an IDA18 commitment, which is informing the project's design.

26. **The project will be implemented in coordination with the Niger Basin Authority (NBA) for transboundary water resources monitoring in support of integrated management and flood-response coordination.** Synergies will also be sought with the Western Africa and Sahel Regional Hydrometeorological Services Modernization Program Phase I (P166987) which includes Chad, Mali, and Togo, but not yet Cameroon. Similarly, the Sahel Irrigation Initiative Support Project (P154482) covers all of the Sahelian countries except Cameroon; therefore, synergies in their modernizing of institutional frameworks, including land access and use rights in public irrigation schemes and knowledge management components will be sought. This project will also use the experience of projects implemented in rural areas, like the Cameroon Sanitation Project (CAMSAN; P107102), as well as the Community Development Program Support Project (Programme National de Développement Participatif, PNDP, P144637), which developed specific mechanisms of implementation to provide access to basic services to the rural population.

COVID-19 Impacts and Responses

27. **Currently, this unprecedented pandemic is having repercussions in all socio-economic and financial aspects of the country.** These include, among other things, a substantial drop in budget revenue, a significant deterioration in macroeconomic accounts, a reduction in external funding, a disturbance in intra-Community trade, a weakening of external and financial stability, a risk of a rise in inflationary pressures, and a deterioration in the behavior of economic agents (households, businesses, and the State). In response to these impacts, the International Monetary Fund (IMF) approved on May 4, 2020, a disbursement of US$226 million under the Rapid Credit Facility in order to cope with the budget deficit caused by the COVID-19 pandemic in Cameroon and the drop-in oil prices.

28. **The spread of COVID 19 in Cameroon is expected to worsen in the medium term and affect negatively the country's fiscal capacity, trade, and consumer spending.** The first positive case of COVID-19 in Cameroon was diagnosed on March 6, 2020. On March 18, 2020, the Cameroonian Prime Minister closed land, air, and sea borders and took 12 other non-pharmaceutical public health measures to contain the outbreak. Since then, the Government has launched several measures to stop the spread of COVID-19 in the country, including use of masks, production of drugs, intensification of screening campaigns, and awareness raising, among others. Notwithstanding the enforcement of these different containment measures, GoC is yet to develop a framework for decision making regarding the implementation of non-pharmaceutical interventions for COVID-19 mitigation.

29. **In May 2020, the GoC adopted a comprehensive socio-economic response plan to mitigate the impact of the COVID-19.** Following the first confirmed case, the GoC put in place an immediate response plan in March 2020 to address the spread and effects of the virus. The comprehensive response plan approved in May 2020 is estimated at XAF 436 billion (about US$782 million or 2 percent of GDP) and is framed around five pillars: (i) strengthening of the health system; (ii) economic and financial resilience; (iii) strategic sourcing; (iv) strengthening research and innovation; and (v) social resilience. Under this plan, the GoC has ramped up financing for the social safety nets program, which will provide cash transfers to at least 22,500 vulnerable households in 2020. The GoC has also introduced a package of fiscal measures to support enterprises, including time-bound tax exemptions and deferrals in tax payments. At the same time, the Bank of Central African States *(Banque des États de l'Afrique centrale,* BEAC) adopted several measures to extend liquidity to commercial banks and improve financing conditions for the private sector. In the course of preparing the US$100 million Development Policy Operation (DPO), the GoC has already met two prior actions. The third prior action will be implemented through the Program with IMF and the Debt Services Suspension Initiative (DSSI). The Sustainable Development Finance Policy (SDFP) is currently being prepared for Cameroon to be part of the third batch of countries benefitting this facility.

30. **The WBG is developing a full-fledged response mainly through active projects by adjusting and reorienting activities, using and restructuring existing CERCs and including CERCs in projects under preparation.** Support to health for saving lives was immediately provided through the CERC component of the *Heath System Performance Reinforcement Project* (P156679) in the amount of US$6 million, which financed rehabilitation of health facilities, purchase of medical equipment and other supplies required for the emergency response. In addition, a US$29 million COVID-19 Preparedness and Response Project (P174108), which will provide support to the health system at the national and district levels to enhance the COVID-19 response is in the process of approval.

31. **The WBG response is also advancing on the social response pillar, "***protecting the poor and vulnerable"*, in particular safeguarding education and broad-based human capital in a country where the Human Capital Index is only at 0.39. The ongoing *Education Reform Support Project (ERSP, P160926)* has been adapted to ensure the safe reopening of schools in October and a clear Government Plan is now validated. More funding will be allocated to the expansion of the *Social Safety Nets Project (SSNP, P128534)* to protect livelihoods for both poor households and vulnerable groups, including households in urban areas, affected by the COVID-19, with special gender considerations. Social safety nets coverage will include cash transfers and public works. In addition, the third DPO of US$100 million (P168332) (under preparation), has been adjusted to reinforce the fiscal response to the crisis through the following measures: (i) exemptions from customs duties and value-added tax (VAT) for items required for COVID-19 prevention and treatment; (ii) fiscal measures to support the sectors most affected by the crisis; and (iii) emergency cash transfers and expansion of targeted social safety nets to alleviate the impact of the crisis on the poor.

32. **Finally, various interventions and policy advice will support a resilient recovery**: The Safety Nets Projects is working towards development and operationalization of a unified social registry and the *Agriculture Investment and Market Development Project (AIMDP, P144137*) will contribute to safeguard food security and nutrition by fast tracking the provision of key inputs for the next cropping season to support the value chains at the level of both farmers and small and medium enterprises (SMEs).

33. **The proposed project forms an integral part of support to the WBG crisis response.** The project will support its second thematic pillar, which is protecting poor and vulnerable people from the impact of the

economic and social crisis triggered by the pandemic. By means of vouchers and other subsidies, the project will enhance the resilience of the poor to cope with threats such as the pandemic. The project is forecasting around US$20 million to this purpose. In addition, in the medium-term, to mitigate the COVID-19 impact, the Government aims to reduce dependency on imports by balancing the modernization of agriculture with reliance on the country's resources and manpower. Particular emphasis will be placed on increasing the production of food crops (rice, maize, sorghum, starchy foods), livestock and fishery products.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

34. The Project Development Objective (PDO) is *to provide sustainable irrigation and drainage services and to improve agricultural production in the irrigated areas of the Benue Valley*. Sustainable irrigation means that the benefits will last beyond the project, preserving the quality of the soil, water, and production, based on environmentally friendly agricultural practices, solid farmers' organizations and sustained technical assistance. This will be measured by the value of agricultural production.

PDO-Level Indicators

35. The PDO level indicators are:

(a) Total area irrigated (hectares);
(b) Irrigation scheme management transferred to Water Users Associations (hectares);
(c) Area prepared by private enterprises (hectares);
(d) Value of agricultural production in rehabilitated and improved irrigation areas (CFA million /year); and
(e) Direct beneficiaries (number), disaggregated by female (percentage).

B. Project Components

36. **Project strategy**. The project would achieve the PDO through: (i) support to water security and governance of the water resources, including water infrastructure safety and operations, construction and rehabilitation of irrigation and drainage (I&D) infrastructure, and support to water users institutions; (ii) promotion of agricultural production and agribusiness, including PLL, land preparation, mechanized paddy cultivation operations, access to inputs and technical assistance (TA), and support to SMEs; and (iii) capacity building of MEADEN and the strengthening of public services including research and innovation. The project would also include flood-preparedness and transboundary cooperation in the Benue Valley that is part of the regionally significant Niger basin. The project has been designed to build resilience against several of the aforementioned climate risks facing the North, especially drought, extreme precipitation, and flooding.

37. **The proposed project will consider the key characteristics or 'attributes' for resilient systems as part of its approach to building resilience of vulnerable farmers in the Benue River Valley.** This approach will consider robustness, diversity, flexibility, connectedness, and inclusion (see Annex 9)[7] as well as help improve the capacity of poor people to prepare, cope with, and adapt to climate change impacts. For example, access to water resources monitoring and information systems can improve local decision-making, contributing to robustness and to the capacity of vulnerable communities to prepare for the impacts of floods.

[7] ACBP (2018), Africa Climate Business Plan (ACBP) Third Progress Report, World Bank, Washington, D.C.

38. **The project would develop irrigated agriculture on both banks of the river immediately downstream from the dam, and the improvement of agriculture practices in the valley, including land tenure right management in the public irrigation scheme.** In accordance with World Bank OP 4.37, project financing would include aspects related to the safe operation and sound maintenance of the dam and appurtenance structures to ensure their long-term integrity and safety in accordance with Good International Industry Practice (GIIP). The project will be financed by an IDA credit in the amount of US$200 million for a duration of seven years. The project will have the following four components:

Component 1: Improvements of Infrastructures and Water Management (US$166.9 million of which US$153.0 million equivalent from IDA and US$13.9 million equivalent from beneficiaries)

39. The component is organized into three subcomponents: (a) upstream water resources monitoring and coordination by operationalizing the Water Management Committee of Lagdo dam *(Comité de Gestion de l'Eau du Barrage de Lagdo),* as well as operation and safety of the Lagdo dam (which is managed by the public-private partnership company that produces and distributes energy in Cameroon named ENEO); (b) on the RB: irrigation rehabilitation of 1,090 ha and development of 4,230 ha, both for small farmers; on the left bank (LB): 3,628 ha for agro-industrial development and 1,496 ha for small farmers in existing villages within the perimeter; and (c) irrigation management transfer to the WUAs on both banks.

40. The project interventions have been sequenced based on the following. First, the Water Management Committee of Lagdo needs to become operational and water release management needs strengthened when there is a surplus of water. Second, the irrigation schemes of the RBIS-Lagdo and those on the left bank irrigations scheme (LBIS) (LBIS-Lagdo) need to be developed and transferred to their respective WUAs. Creation and extensive training of the WUAs need to be undertaken, and performance agreements between MEADEN and the WUAs need to be put in place. A WUA oversight unit also needs to be established within MEADEN. This component contributes to both climate change adaptation and mitigation. This component will finance studies, consulting services, works, equipment, and training.

41. A social assessment has been undertaken during preparation to cover the following aspects: land occupation status in the areas to be developed, land access in the project area, land status for women, land allocation method in the developed areas, types of conflicts with prevention and management mechanisms, migratory flows, GBV, organization of producers, typology of potential farmers, and conditions of parcels allocation. This study provides analyses and recommendations to improve irrigation scheme land tenure rights for both female and male irrigators in consistency with the current legal framework and lessons learnt from similar contexts. In addition, the concept of WUAs is new to Cameroon, and extensive training will be undertaken for ensuring the long-term sustainability of the investments. Funds will be provided to train the WUAs as well as to support the development of appropriate legislation for the creation of the WUAs (this is already on-going with the PULCI project, P143940).

42. **Subcomponent 1.1: Security and Operation of Main Hydraulic Infrastructure** (US$9.0 million from IDA). Based on the existing studies, particularly the dam safety assessment report done during preparation (see also dam safety aspects of the Lagdo dam in Annex 7), and a comprehensive hydraulic and hydrological study of the entire basin to be done during implementation, six main activities are envisaged under this subcomponent: (i) establishing a Water Resources Monitoring Network and Information System in order to improve the hydro-meteorology in the entire basin, including the sub-basins of the Kebbi and Faro rivers; (ii) ensuring long-term dam operation (limit releases to less than 1,800 m^3 per second to protect planned investments and people downstream) and safety of the Lagdo dam; (iii) establishing a panel of experts on dam safety and water management; (iv) elaborating a joint flood forecasting model in the Benue and Mayo Kebbi river sub-basins and improving the management of the dam and its water releases; (v) establishing and putting

in place a flood early warning system from Lagdo down to the border with Nigeria; and (vi) strengthening regional coordination with the NBA.

43. **Subcomponent 1.2: Irrigation and Drainage Infrastructure** (US$148.9 million of which US$135.0 million equivalent from IDA and US$13.9 million equivalent from beneficiaries). Studies to establish a detailed update of the feasibility, design, and bidding documents are currently on-going for the equipment of roughly 10,000 ha of irrigation schemes with an annual water demand of 205 million m^3 per year (51 percent below the original amount attributed and only about 5 percent of the current reservoir capacity). The entire irrigation schemes are expected to use zero-emissions, gravity-based systems. The irrigation schemes will improve farmers' resilience to droughts, exacerbated by climate change, while also promoting efficient water usage. The project is also planning the construction of protection dykes on each bank of the Benue River of around 18 km designed to withstand floods of a 100-year return period.

44. **The Resettlement Action Plan (RAP) will be financed by IDA**. It will include payment of project-affected people (PAPs) for undertaking some of the environmental services set out in the Environmental and Social Management Plan (ESMP), such as reforesting river banks. No land acquisition or cash compensation is envisaged under the RAP, and if any such expenses arise, they will be financed out of the Borrower's own resources.

45. **Subcomponent 1.3: Irrigation and Drainage Management** (US$9.0 million from IDA). This Subcomponent will address the daunting challenge of ensuring the long-term viability/sustainability of the irrigation and drainage services delivered on the irrigation schemes. The first step will be the adoption of a Decision by MINADER approving the management rules for irrigation schemes in the Adamawa, North and Far-North regions. Based on this, a scheme management code for each scheme (RB and LB of Lagdo) will be elaborated, that will set out the basic rules for: (i) land tenure arrangements; (ii) WUA rights and duties; (iii) WUA legal/financial oversight; (iv) rehabilitation/construction, training and transfer agreements; (v) rights and duties of the parties; and (vi) dispute resolution mechanism.

46. **This subcomponent also includes the process of allocating plots and includes specific activities for smallholders on both banks and for large landholders on the LB**. The subcomponent will be implemented using TA, and the proposed approach is as follows: (i) definition of criteria for the allocation of plots; (ii) constitution of WUAs (based on secondary canals); (iii) development of the allocation contract including the specifications for land-use contracts; (iv) implementation of a scheme management code for the RB and LB Lagdo irrigation schemes to provide the regulations for the transfer of irrigation management to the WUAs ensuring a compulsory membership; (v) updating the database of beneficiaries and developing the Geographic Information System (GIS; cartography); (vi) issuance and signature of contracts and allocation of plots; and (vii) training, equipment, facilities and support for WUAs for two years. Some of these points, such as (iii), (iv) and (vi) will be subject to World Bank no objection. In addition, the TA will also work at national level for supporting the preparation of a legal framework for irrigation management by the WUAs in the revised Water Code or a separate irrigation law; and, for the operationalization of this approach, will ensure awareness and communication; identification and optimum localization of plots for each beneficiary; and management of the subsidy mechanism for the revival of agricultural production by purchase vouchers (part of Subcomponent 2.1, see details in Annexes 2 and 5).

Component 2: Support Services for Agricultural Production (US$61.1 million of which US$21.0 million equivalent from IDA and US$40.1 million equivalent from beneficiaries)

47. Considering the redefined role of MEADEN in the Benue Valley as a public sector agent (see Component 3 below), this component will focus on encouraging a prominent private sector role to improve production, markets, and agricultural support services with an emphasis on improving efficiency along the value chain of

rice and other irrigated crops. It will do so by supporting: (i) the demand side for PLL, land preparation services, agricultural inputs and advisory services, and mechanized paddy cultivation operations; (ii) the supply side of goods and services; (iii) the development of a network of management support centers through the subcomponents described below; and (iv) technological innovation and vocational training (Component 3).

48. **Subcomponent 2.1: E-vouchers for Launching Production in the Irrigation Perimeters** (US$15.3 million of which US$8.5 million equivalent from IDA and US$6.8 million equivalent from beneficiaries). This subcomponent will support the capacity of farmers to purchase agricultural inputs, pay for the water fee, pay for (mechanized) labor, and do PLL; all in a regressive manner with support to be phased out after one, two, or three years, depending on the type of inputs (see Annex 2). For each beneficiary a subsidy of the order of US$350 will be provided during the first year, approximately US$200 during the second year, and approximately US$75 for the third year, assuming that, under the project, farmers will be able to increase production from one to two crops per year, with private sector support under the reformed MEADEN. An e-voucher mechanism will be established, through which electronic purchase orders will be based on the E-Voucher Manual of the project following the guidelines of the recently completed MINADER Manual of Agricultural Input Subsidy Procedures adopted by Prime Ministerial Decree on August 28, 2019. Beneficiary contributions are estimated to be in the order of US$6.8 million, and they will be further defined in the E-vouchers Manual, to be cleared as a disbursement condition for this subcomponent. These amounts will be subject to change according to experience on the ground as the project is implemented. Given the large number of farmers/vouchers, as well as necessary close coordination with Subcomponent 1.3, the same TA will accompany the PIU to implement this Subcomponent 2.1.

49. **Subcomponent 2.2: Matching Grants for Production and Agribusiness** (US$44.3 million of which US$11.0 million equivalent from IDA and US$33.3 million equivalent from beneficiaries). This subcomponent will finance: (a) Provision of Matching Grants to Beneficiaries to support activities related to, inter alia, agricultural production, mechanization, agricultural value addition, commercialization, farmer-led irrigation and agricultural service provision (“Sub-Projects”) for a minimum of US$9.5 million, and (b) provision of TA, studies and related support for the administration and management of Matching Grants for US$1.5 million. Matching Grants will be provided to producer organizations, associations, cooperatives, entrepreneurial farmers, and established agribusinesses or startups through grant windows tailored to achieve specific outcomes in terms of improving production, value addition, commercialization, and service provision. Following a call for proposals to submit business plans (BPs), grants will be awarded on a competitive basis for up to three years to co-finance eligible subprojects. Proposals will consist of investments, TA, and working capital and be prepared with assistance from professionals through a consultant. The matching grant facility will be implemented by the PIU and supported by a consultant hired for the duration of the project and its operation detailed in the Grants Manual to be cleared as a disbursement condition for this subcomponent. The subcomponent will finance grants, studies, and consultant services. These activities will help promote crop diversification, including promoting perennial crops that act as carbon sinks, while also promoting efficient water use in the face of water shortages exacerbated by climate change.

50. This subcomponent will have three main windows: one for larger grants (less than US$100,000, subsidy up to 50 percent) based on detailed business plans; one for medium-size investments (less than US$6,000, subsidy of 70 percent for men and 80 percent for women); and one for small investments (less than US$1,000, subsidy of 80 percent for men and 90 percent for women) based on simplified business plans. Details will be provided in the Grants Manual. The service provider for preparing business plans will have experience in supporting women farmers and women organization and will be able to adapt the services to their specific needs in order to achieve a target of 30 percent of women for the medium-size and small grants. The large

grants will focus mainly on sub-projects to improve production (e.g. women-run pisciculture from borrow-pits in the perimeter), value addition (e.g. rice de-husking and packaging), commercialization (collection and transport centers, storage systems), mechanization and service provision and the on-farm equipment for the land allocated to the SMEs. Other options could be startups to innovate with low-cost technologies (e.g. linking multiple small- and medium-scale mechanization service providers with small farmers using cell-phone-based registration systems, and 'Mobile Money' – the latter has deeply penetrated into Cameroon's rural areas). The mid-size grants will focus mainly on mechanization services (e.g. mechanical maintenance workshops, land preparation with power tillers, harvesting, threshing, planting, etc.) and all type of agricultural and transformation equipment. The small grants will be focused mainly on the promotion of farmer-led irrigation. A small-scale irrigation model for individual farmers is developing spontaneously in the Benue valley. It is oriented towards the production of counter-season vegetable crops (October to April), and complementary irrigation in the rainy season (May to September) of rice and maize. Farmers irrigate small plots, most often less than 0.5 hectares, with motor pumps from the Benue river or from the catchment with manual drilling of shallow groundwater (less than 7 m deep). The potential for expanding irrigable areas with the adoption of this irrigation model is very high. The matching grant mechanism will support the financing of micro-projects involving affordable equipment for the collection of water with manual drilling, motorized pumping, and efficient distribution of water by pipeline and small distribution (e.g. California type).

51. **Subcomponent 2.3: Establishment of Organizational Management Support Centers** (US$1.5 million from IDA). The project will promote a network of Rural Economic Management Centers *(Centres de Gestion Economique Rural, CGERs).* Based on an enterprise-based model for the delivery of support services, CGERs will be one-stop-shops that provide smallholder farmers, producers organizations, WUAs, cooperatives, and enterprises with quality assistance services that are affordable and tailored to the financial capacities of recipients. These services will typically include accounting, financial management (FM), procurement, management, and in general all functions that support organizational and governance functions for organized producers and enterprises. The CGERs will adapt those services to take into account the different situations and needs of male and female farmers and organizations composed by and/or led by women. The model is based on the successful experience promoted by the National Society for Land Improvement and Development (*Société Nationale d'Aménagement et d'Exploitation des Terres, SAED)* in Senegal. Two CGERs will be established in Lagdo and Garoua during the first year of implementation, with the assistance of a consultant to ensure a proper sequencing of the implementation of project activities.

Component 3: Capacity Building and Implementation (US$33.0 million of which US$26 million equivalent from IDA and US$7.0 million equivalent from GoC)

52. This component will finance institutional strengthening of selected public sector agencies especially MEADEN's role as a public institution responsible for the development of the whole of the North region, and the project implementation through a PIU.

53. **Subcomponent 3.1: Institutional Strengthening** (US$5.0 million from IDA). This subcomponent will focus on the reorganization of MEADEN and training of its staff. The reorganization will include the transfer of aspects of MEADEN's present operations such as irrigation management within the rice fields to the WUAs and land preparation to the private sector, while strengthening MEADEN's important residual roles of providing support to the WUAs, managing the main water infrastructure, and overseeing hydrology, research, water management within the catchment area and providing an early warning system and rapid response to flooding and other emergencies. No later than six months after the effective date, MEADEN will provide to the World Bank a detailed reorganization plan for clearance with objectives, actions, responsibilities, timing, and costing for a 3-year implementation with clear milestones. During project implementation, the World Bank will monitor the plan and review the milestones in order to provide necessary support. During the Mid-term

Review, the implementation of the reorganization plan will be assessed and corrective measures will be taken, if necessary. The reorganization plan will gradually reinforce the MEADEN team (see Annex 2 for a proposed new organogram), while the PIU will focus on project management from the beginning. Specialized intensive training will be provided to the staff of new specialized units like a Water Resource Unit (for supporting the Water Management Committee of Lagdo dam/*Comité de Gestion de l'Eau du Barrage de Lagdo*) and a WUAs Oversight Unit.

54. **MINADER is responsible for extension in the country.** MEADEN will also sign a Memorandum of Understanding (MoU) with MINADER to ensure that qualified extension agents are present on the irrigation schemes to ensure the provision of agricultural extension support. An estimate of one agent per every 250 hectares has been agreed with the GoC.

55. GoC authorities undertook a study visit in January 2018 to the SAED operations in the Senegal river's delta, where WUAs are operating efficiently. Following the same model, funds would be provided to continue the South-South partnership with SAED, and to develop arrangements between MEADEN and the WUAs similar to the ones operating in Senegal.

56. **Subcomponent 3.2: Agricultural Innovation and Training** (US$5.0 million from IDA). The project will promote partnerships for improving irrigated agriculture in the Benue valley with other institutions providing education and training at three levels: (i) higher education such as the University of Maroua, *Ecole Technique d'Agriculture de Garoua*; (ii) technical and vocational training such as *Lycée technique du Centre professional Agricole à Lagdo;* and (iii) at local level through the creation of a Technical Innovation Center (TIC).

57. At higher education as well as at technical and vocational training level, a training program in irrigation (from civil works to irrigation scheduling) will be supported in order to develop capacities in the North and Far-North of Cameroon. Collaboration with other institutions (such as the Institute for Water and Environment in Burkina Faso) will be explored in order to develop a scholarship and training program based on a Scholarship Manual (to be prepared as a disbursement condition for this activity) for reinforcing the capacities of Cameroonians living in the North of Cameroon. Several scholarships will be provided to encourage women and youth from the Lagdo area to study in Garoua/Maroua.

58. At the local level, innovation will be supported by project financing of a newly created Technical Innovation Center (TIC)/*Centre d'Innovation Technologique (CIT).* Established at the heart of the Lagdo perimeter, the CIT will be set up as an association with a board of directors, including key stakeholders of the Benue Valley (WUAs, Cooperatives, Common Interest Groups (CIGs), Regional Support Center for Agricultural Professionnalisation *(Centre Régional d'Appui à la Professionalization Agricole,* CRPA), National Confederation of Cotton Producers of Cameroon *(Confédération Nationale des Producteurs de Coton du Cameroun, CNPC-C)*, Institute of Agricultural Research for Development (IRAD), the Cotton Development Society for Cameroon/*Société de développément du Coton du Cameroun (SODECOTON)*, MINADER, and MEADEN). The CIT will be producing pre-basic seeds and monitor basic and certified seed production. The PIU will have an agronomist specializing in technological innovation, and will work in partnership with IRAD and Africa Rice.

59. Agricultural vocational training will be promoted to transfer the innovations tested by the CTI to the relevant stakeholders of the Benue Valley and to the various agricultural training institutions in the region. The CIT will periodically organize demonstrations and training sessions in the Benue Valley for rice producers, extension agents, teachers, students, and other relevant categories with an emphasis on small-scale production, mechanization, and small-scale irrigation.

60. **Subcomponent 3.3: Project Implementation and Monitoring and Evaluation (M&E) Support** (US$23.0 million of which US$16.0 million equivalent from IDA and US$7.0 million equivalent from GoC). This

subcomponent will support the PIU which will be responsible for the day-to-day implementation of the project. The proposed structure of the PIU (see staff list in Section III A 'Institutional and implementation arrangements' and key job descriptions/profiles have been developed and agreed with MINEPAT, and the core team is expected to be in place before effectiveness. Core functions and structure are detailed in the section on implementation arrangements below. Funds would be provided to meet salaries and allowances of PIU staff and to cover operational expenses. Government counterpart funding will cover the costs of the (i) Steering Committee; (ii) the Regional Technical Committee; (iii) the Special Tender Board; (iv) any costs (including per diems) related to the carrying out of site visits, and follow-up and supervision missions and similar; and (v) any other costs required for project implementation that are not eligible for financing by IDA (e.g. payments of government civil servants, such as MEADEN staff). In the event that counterpart resources are not available for critical joint missions, whether for support, supervision or mid-term review, these could be financed by project funds after approval by the World Bank. In addition, baseline information will be collected before the start of production activities to allow for an impact evaluation at the end of the project. In consideration of the difficulty of attracting qualified and motivated staff to the Lagdo region, the project will finance under this component works to provide housing and other facilities for the PIU staff, and it will finance utility costs. This subcomponent will finance salaries, vehicles, operational costs, and consulting costs (see Annex 1 for more details).

61. The proposed project may qualify for adaptation and mitigation co-benefits in the form of adoption of climate-smart practices, promotion of zero-emission gravity-based irrigation systems, and agricultural management activities that improve carbon pools. Project activities proposed under Components 1 and 2 are included on the "List of activities eligible for classification as climate mitigation finance" in the 2016 Joint Report on Multilateral Development Banks' Climate Finance under category 4, sub-categories 4.1 and 4.2. A Greenhouse Gas (GHG) assessment, using conservative boundary values, has been performed for this project using the Food and Agriculture Organization (FAO) Ex-Ante Carbon Balance Tool (EX-ACT). The results show that the project creates a total net carbon sequestration of -301,549 tCO_2-eq across the project's economic lifetime, with average annual net emissions of 15,078 tCO_2-eq and economic lifetime gross emissions of 400,309 tCO_2-eq. Improved water resources management and System of Rice Intensification (SRI) activities to reduce methane emissions from rice cultivation lead to net emissions for Phase I of -95,073 tCO_2-eq, representing a decrease in net emissions. The net emissions for Phase II are estimated at -245,544 tCO_2-eq. Improved water resources management and the promotion of perennial crops lead to net emission reductions. The net emissions of Phase III are estimated at 39,068 tCO_2-eq, though the improved water resources management and promotion of perennial crops under this phase do see net emission reductions of -513,421 tCO_2-eq. Under all three phases, the use of gravity-fed irrigation systems means that there would be no emissions from energy use from pumping. Greater access to irrigation under all three phases helps to promote perennial cultivation, which acts as a carbon sink, while also increasing the carbon sequestration potential of soils and annual crops. In addition, the promotion of SRI, land leveling, and land preparation activities under Subcomponent 2.1 are expected to limit methane emissions compared to flooded rice practices that are used locally. In addition, the activities under Component 1 to improve the operation of the Lagdo Dam and investments in downstream irrigation infrastructure will simultaneously improve beneficiaries' resilience to climate change-exacerbated droughts. The activities under Component 2 will give farmers the incentives and ability to use water resources more efficiently during climate change-induced droughts, while also limiting the amount of flooding required to cultivate rice, thus limiting methane emissions. The activities under Component 3 will increase the technical capacity of the client to plan for the effects of climate change-related shocks to water availability in the project area.

Component 4: Contingent Emergency Response (US$0 from IDA)

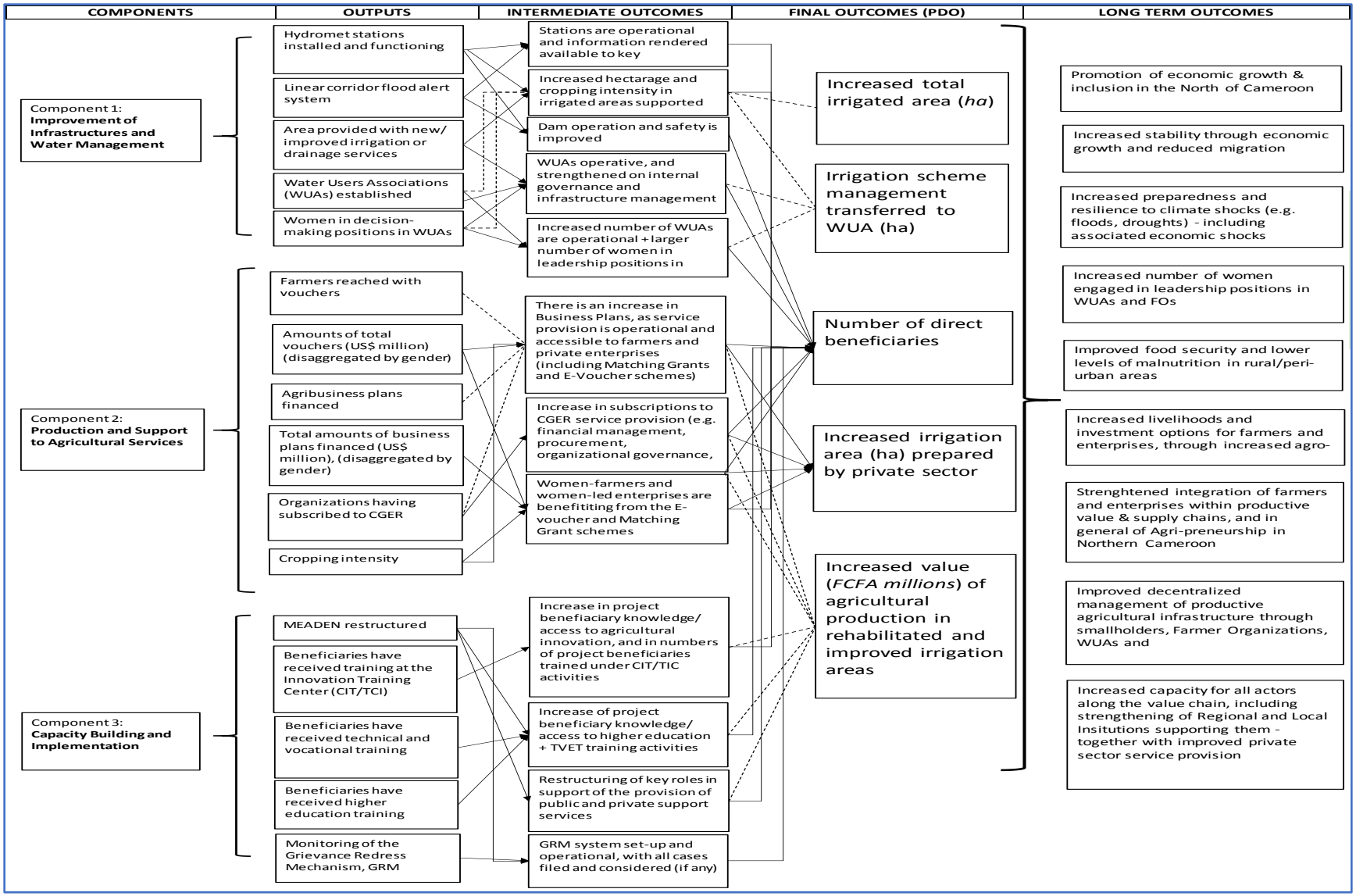
62. Following an eligible crisis or emergency, the Recipient may request the World Bank to re-allocate project funds to support emergency response and reconstruction. This component would draw from the uncommitted credit resources under the project from other project components to cover the emergency response.

C. Project Beneficiaries

63. **Beneficiaries**. The proposed project is expected to improve the social well-being of the Cameroonian population living in the project area in the North, in particular by (i) improving incomes for rice farmers through improved services and yields; productivity gains in irrigation farming, including also crops other than rice, are expected to lead to ripple-effect benefits in the form of local economic activity for agricultural services (land preparation, farm mechanization, transport, input-supplies, milling, and marketing), and increased food availability at reduced prices, particularly during the DS; (ii) improved food security through increased national rice production in the North, which is regularly affected by droughts and food security issues particularly as the country is importing large quantities of rice; and (iii) reduced vulnerability of the riparian communities to flooding in the future once the dykes have been constructed and assuming that the ENEO power company adheres to the agreed pattern of occasional releases of surplus water when necessary. The direct beneficiaries of the project are male and female farmers, with or without land, that carry out agricultural activities in the irrigation perimeters, and along the river. The direct beneficiaries of the Project are about 26,000 people and around 100,000 indirect beneficiaries, mainly household members. Taking into account the early warning system for flood risks, the number of beneficiaries is around 1 million inhabitants in the valley. In terms of the impact of dam safety, the number of beneficiaries is estimated at more than 2.2 million inhabitants, combining the populations of Cameroon and those of Nigeria bordering the Benue.

64. Different groups of poor can be expected to benefit from increases in agricultural and water productivity in the Benue Valley. Poor farmers will benefit from higher incomes brought about by productivity gains, while non-farmers in rural areas benefit from spill-over gains. Women farmers will benefit from the focus on the specific challenges that they face and increased access to land, credit, and support services. When increased agricultural productivity leads to increases in food production, lower food prices will benefit the urban poor and net food buyers in rural areas, often the poorest. An important transmission mechanism from agricultural productivity to aggregate growth is through the price of food, as it allows sustaining lower labor costs in the rest of the economy.

D. Results Chain



E. Summary Project Costs and Financing

Table 1: Summary Project Costs and Financing (millions of US$)

Components	IDA	Contributions by Beneficiaries	Contributions by Government	Total
Component 1: Improvements of Infrastructures and Water Management				
SC1.1: Security and Operation of Main Hydraulic Infrastructure	9.0	_	-	9.0
SC1.2: Irrigation and Drainage Infrastructure	135.0	13.9	-	148.9
SC1.3: Irrigation and Drainage Management	9.0	–	-	9.0
Sub-total	**153.0**	**13.9**	**-**	**166.9**
Component 2: Support Services for Agricultural Production				
SC2.1: E-vouchers for Launching Production in The Irrigation Perimeters	**8.5**	**6.8**	**-**	**15.3**
SC2.2: Matching Grants for Production and Agribusiness	**11.0**	**33.3**	**-**	**44.3**
SC2.3: Establishment of Organizational Management Support Centers (CGERs)	**1.5**	**_**	**-**	**1.5**
Sub-total	**21.0**	**40.1**		**61.1**
Component 3: Capacity Building and Implementation				
SC3.1: Institutional Strengthening	**5.0**	–	-	5.0
SC3.2: Agricultural Innovation and Training	**5.0**	–	-	5.0
SC3.3: Project Implementation and M&E Support	**16.0**	_	7.0	23.0
Sub-total	**26.0**	**-**	**7.0**	**33.0**
Contingent Emergency Response Component (CERC)	**0**	**-**	**-**	**0**
Grand Total	**200.0**	**54.0**	**7.0**	**261.0**

F. Rationale for World Bank Involvement and Role of Partners

65. **The World Bank brings global experience and knowledge on promoting the sustainable development of the irrigation and agri-food sector.** By its strong presence and engagement in Cameroon, the World Bank can support the Government's efforts to unlock Cameroon's agriculture potential in the Benue valley as envisaged under the project. World Bank financing will support the much-needed productivity and production increases by improving and expanding irrigation services. The project will provide real opportunities for efficiency improvements by expanding private sector involvement.

66. **Role of Partners.** The project will seek collaboration with IFC that is going to support investors interested and willing to establish agri-businesses in the irrigated perimeters. The German International Development Agency is also starting a project of watershed management around the Lagdo reservoir, and collaboration is being established with MEADEN. The French Development Agency (*Agence Française de Développement,* AFD) and the European Union (EU) are also financing watershed activities and work in close collaboration with MEADEN. In addition, the Syngenta Foundation and the International Fertilizer Development Center (IFDC) have shown interest in collaborating with this project. The Syngenta Foundation has financed and supported the establishment of services, such as mechanization and storage, with SAED in Senegal. IFDC is supporting the promotion of an integrated urea deep placement program, similar to the Systems of Rice Intensification in north Nigeria, in collaboration with USAID and the World Bank Project on Transforming Irrigation Management in Nigeria (TRIMING, P123112) with great success in reducing production costs and improving rice quality.

G. Lessons Learned and Reflected in the Project Design

67. **Lessons learnt in other African countries, as well as in all the Organisation for Economic Co-operation and Development (OECD) countries, show that it is fundamental to bring in the private sector and farmers organizations** for maximizing cropping intensity (e.g., in Senegal, it is presently almost 2) for services such as mechanization and commercialization to promote WUAs' participation for irrigation service delivery, and other institutions for knowledge and training. For the last 30 years, SAED, in Senegal, has had an extensive program of transfer of responsibilities to WUAs and farmers groups, reaching a high degree of delegation and crop intensification in the Senegal river valley. The *Office du Niger* in Mali has had a similar process of transfer of responsibilities. The World Bank has been supporting other countries such as Nigeria with the TRIMING project (P123112) and in Ghana with the Ghana Commercial Agriculture project (P162525). Similarly, in Niger under the Second Public Investment Reform Support Credit (PIRSC2; P159969), the World Bank has been working on the creation of the legislation for irrigation.

68. **African countries are getting up-to-speed in putting in place institutional frameworks and in the application of modern principles for irrigated agriculture and land tenure security.** Four key conditions are required for the proposed project to be able to succeed in its expected transformational role: (i) Government commitment to financial sustainability and institutional reforms; (ii) Accountability of irrigation agencies to farmers; this includes a commitment from agencies to provide satisfactory services; (iii) Participation of water users through empowered WUAs, which set and collect fees and also make spending decisions; and (iv) Farmers' willingness and ability to pay Operations and Maintenance (O&M) fees. All these conditions, and some supplemental as needed, such as a strong local private sector for provision of services, will be in place at the completion of the proposed project.

69. **Lessons regarding the matching grants learned from the PIDMA and the Livestock Development Project (PRODEL; P154908) projects include**: (a) it is very important to have proper support mechanisms for the preparation of BPs: (i) there are few qualified technical service providers in Cameroon (this is a principal constraint in PIDMA and PRODEL), therefore it would be useful to plan to mobilize qualified operators,

internationally recruited if needed; and (ii) those implementing actions with matching grants need a lot of support from the service providers during both preparation and implementation of BPs; (b) the preparation of some standard BP models is very useful to help and guide project holders and technical services providers; (c) it is important that the selection process ensures equity, transparency, and accessibility of the matching grants to the targeted farmers (one must look carefully at the selection criteria, how they plan to communicate, etc.); (d) one size does not fit all - one has different types/mechanisms/sizes of matching grants to respond to the differentiated needs of the farmers; (e) it is important to have simple procedures which are implementable to avoid lengthy instruction times; (f) it is better to decentralize the instruction of demands to streamline procedures; and (g) it is useful to plan from the start a mechanism for sharing lesson and to improve/simplify the processing of requests where feasible.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

70. **The overall oversight of the project is with MINEPAT, with the responsibility for project implementation delegated to MEADEN.** The project implementation mechanisms will comprise of a Project Steering Committee (PSC), a Regional Technical Monitoring Team (RTMT), and a PIU hosted by MEADEN. A Project Implementation Manual (PIM) satisfactory to the Association has been prepared, and Project Procedures Manual (setting out guidelines and procedures for administrative, FM, and disbursement, and other fiduciary matters under the project) and an M&E Manual will be prepared no later than two months from effectiveness. An Irrigation Scheme Management Code for each of the irrigation schemes will be prepared no later than 18 months after effectiveness. In addition, no disbursement in the related categories will happen before approval of: (i) an E-voucher Manual; (ii) a Grants Manual; and (iii) a Scholarship Manual.

71. **To implement the proposed project, MINEPAT will create under MEADEN a dedicated PIU based in Lagdo, with the technical, fiduciary, and safeguard skills necessary for the satisfactory implementation of the project.** The PIU will include: a Coordinator, an Administration/Financial Specialist, an FM Specialist, a Senior and a Junior Procurement Specialist, two Accountants (one for general work and one for the vouchers), an Internal Auditor, a M&E Specialist, an Environmental Specialist, a Social Specialist, a Gender Specialist, a Lawyer, an IT Specialist, a Hydrologist, an Engineer, a Works Control Specialist, an Agronomist, an Agri-business Specialist, an Agricultural research Specialist, an On-farm Water Management and Farm Mechanization Specialist, and a Communications Specialist. Additional offices will need to be constructed in Lagdo.

72. **The project staff will be recruited competitively and will have the status of consultants.** They will be financed with the resources of the project. Additional specialists will be hired as deemed necessary during implementation. The hiring process will target experienced staff with proven credentials in their areas of competence and who are familiar with World Bank and/or other donors' procedures. The performance of the entire PIU team will be evaluated annually. The Coordinator will sign a performance contract with the supervising ministry (MINEPAT), while contracts of the other members of the PIU will be signed with the Coordinator on behalf of the MINEPAT. While the recruitment of the PIU staff is underway, the existing PIU for the PULCI Project will be responsible *ad interim* for the initial project implementation activities. The PULCI PIU has been managing the implementation of activities under the PPA, and its mandate has been extended to ensure that it will continue to manage project activities until the project's own PIU is full established.

73. **Under Component 3, MEADEN will be strengthened and modernized.** On the one hand it will gradually terminate operations that are better operated through a functioning private sector, while on the other hand it will take on strategic and regulatory functions that are within the responsibility of a modern public sector agency in charge of the development of the whole North of Cameroon. The current and proposed new structures of MEADEN are described in Annex 2.

B. Results Monitoring and Evaluation Arrangements

74. Project-level M&E systems, which will be detailed in the M&E manual will track progress during implementation, measure intermediate outcomes, and evaluate project impacts. The M&E system will capture information on project results against the targets set as part of the Results Framework (RF).

75. To inform RF indicators at project inception, a baseline survey was undertaken. Beneficiaries will be surveyed subsequently in year 3 (mid-term) and year 6 (project end) to track changes in their livelihood conditions attributable to the project. As the implementing unit, the PIU will be responsible for the overall monitoring and reporting of project progress. In addition to regular monitoring and reporting on the agreed project indicators, activities to be monitored include the timely, efficient, and transparent supervision of procurement and contract management; construction of canals, effective implementation of the ESMP and RAPs; and successful completion of studies and training activities.

76. Progress reports will be prepared for each semester of project implementation and will be submitted to the World Bank no later than 45 days after the end of the period covered by the reports. Monitoring of results and outcomes, in accordance with the project RF (Section VII), will be reported in the project progress reports. An M&E specialist will be retained at the PIU to implement and coordinate all M&E activities under the project. Furthermore, the World Bank will supervise the project over its lifetime. Up to the Mid-Term Review (MTR), which will be carried out no later than four years after effectiveness, the project will produce semi-annual reports. The MTR will reassess the periodicity of project implementation reports as may be required.

C. Sustainability

77. Sustainability of project achievements is predicated on a number of project design features *inter alia* aimed at: (i) reform of the government agency responsible for the development of the North (MEADEN) and also in charge of irrigation development and management in Lagdo; (ii) establishing the necessary frameworks and regulations for compulsory adhesion to WUAs as commonly done in most OECD countries; (iii) increasing competitiveness in the agriculture sector by enhancing productivity and resilience through promotion of private sector participation in irrigated agriculture and access to improved agricultural technologies; (iv) ensuring sustainable support to farmers' access to relevant production information and best practices for decision-making, such as via the Organizational Management Support Centers; (v) mid-to-long term management responsibility over parts of the irrigation schemes shifted to WUAs (formed, trained and capacitated under the project), dealing with both production and maintenance aspects of their production cycle, and with their organizational governance (including women leadership) and FM; (v) supporting farmers and SMEs to access finance for their investments in sustainable production methods; (vi) addressing specific challenges such as largely increasing the available irrigation-equipped area and gaining economies of scale for creating a growth pole for agricultural development in the North; and (vii) empowering local-level stakeholders through training and capacity-building to address specific challenges. Institutional strengthening of MEADEN will make it a more effective institution which is expected to result in more sustainable outcomes for the project area and for the general development of North-Cameroon.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

78. **Technical analysis.** The project has been designed to ensure efficient, sustainable and equitable water resources management and irrigation in the Benue valley and to increase agricultural production, along with improved market access, for both domestic and export markets. The involvement of the private sector and the development of WUAs is expected to increase both the efficiency as well as the sustainability of the system.

79. The project will use improved and increased irrigation in order to increase production and enhance productivity in the Benue valley (particularly of smallholders), reduce vulnerability, boost rural employment, and provide environmental services. Climate-smart technologies exist for farmers to produce two rice crops per year and to diversify production towards higher value crops and aquaculture; the project would thereby contribute to sub-regional food security with a significant national market with potential for large import substitution and large regional export markets. In this context, and considering the redefined role of MEADEN in the Benue Valley as a public sector agent, Component 2 will encourage a prominent private sector role to improve production, markets, and agricultural support services with an emphasis on improving efficiency along the value chain of rice, other irrigated crops and aquaculture.

Development impact in terms of expected benefits and costs

80. The proposed project is expected to contribute to food security, economic growth, and enhanced climate resilience for farmers in the northern regions of Cameroon. It is expected to create the enabling conditions for the development of the Benue River Valley through concerted structural and non-structural interventions. Among these, it is expected to develop sustainable, climate-smart agriculture (CSA) production systems, improve water management, including constructing water harvesting structures, and developing cost-effective irrigation systems and other interventions that are critical to improving agricultural production and water use efficiency at the farm level.[8] The project would also ensure the adoption of modern production technologies and setting up the necessary support for sustainable and inclusive value chain development intended to help farmers to improve their income by growing and marketing higher value crops (HVCs).

81. Project activities are foreseen to yield positive impacts such as (i) safeguarding the basic socio-economic infrastructures in the North region, and (ii) improving food security in the north of the country, where 60 percent of the population are at risk of food insecurity. Rice, one of Cameroon's main food imports, grown in the North by both traditional and modern methods, will particularly be affected, but also other food crops such as millet, sorghum, and maize. Staple foods vary across the country according to ethnic group, but millet and sorghum are among the most widespread. Cotton is the most important cash crop in the North, with farmers receiving incentives and training to boost production. Cotton is the only agricultural industry still being run as a public monopoly. Livestock is also important in the region, particularly for the migrant cattle herders, the Fulani.

82. Three phases were included in the Economic and Financial Analysis (EFA): (i) the rehabilitation of the existing perimeter being planted with rice (approximately 2,180 small farms of 0.5 ha on the about 1,090 ha of Phase I); (ii) the development of the Phase II perimeter on the RB involving about 7,500 small farmers on about 4,435 ha; and (iii) the expansion of the irrigated area along the LB (Phase III), where a 5,014 ha perimeter would be developed with pressurized irrigation, of which about 3,625 ha would be allocated for agro-industrial farms (122 units with 30 ha each) and about 1,496 ha for small farmers in existing villages (about 2,990 households.

83. Total project costs are estimated at US$254 million (US$11.6 million in Phase I, US$100 million in Phase II, and US$142.4 million in Phase III). Investments would be financed by IDA (US$200 million) and by beneficiaries (US$54 million), mainly with loans from commercial banks. The project would be fully justified with an Economic Rate of Return (ERR) of 12.6 percent and a Net Present Value (NPV) of FCFA 60.2 billion (equivalent to US$100.4 million). By adding the GHG emission mitigation, the ERR of the project increases from the estimated 12.6 percent to 14.0 and 14.6 percent, respectively, when using the low and high shadow price

[8] Poor land levelling and preparation is identified as the single most limiting factor in the Benue and other Cameroon irrigation schemes, resulting annually in 30 percent or more losses in the efficiency of water use, leakage of nitrogen, soil compaction, and ultimately poor production.

of carbon. Water productivity would increase from FCFA 7 per cubic meter to FCFA 197 per cubic meter. Labor use would also be increased significantly, by about 58 percent of the current requirements, from 3.6 to 5.7 million person days worked per year at project maturity. Returns per day worked would also grow significantly (at least by 100 percent). Sensitivity of the project results to major implementation risks was analyzed under the following adverse scenarios: (i) all agricultural prices reduced by 10 percent; (ii) investment costs increases by 10, 20, and 30 percent; (iii) no post-harvest value addition for rice and onions; and (iv) agricultural prices drop by 10 percent together with a general investment costs increase by 10 percent. Annex 3 shows that in all cases the ERR (without the GHG benefits as well as reduced price and cost increase options) would remain above 8.8 percent[9] which allows one to conclude that the expected results are robust.

Rationale for public sector provision/financing

84. Disadvantaged smallholder farmers (of which women are a substantial part), face harsh difficulties in emerging from poverty and taking part in commercially demanding value chains (such as those involving HVCs, value addition, agro-processors, quality demanding markets, exports, etc.). The lack of adequate production resources, difficulties in aggregation of smallholder production, and high or total disconnection from the demand side keep smallholder incomes low and uncertain. Smallholders in Northern Cameroon also generally do not have access to credit, not even when organized in associations or cooperatives. As highlighted by the Environmental and Social Impact Assessment (ESIA) report, this concerns very often women who are organized in Common Initiative Groups which are not legalized due to lack of ID cards of members as well as low education levels and financial status.

85. Ecologically, the North is one of the most fragile zones in Cameroon, with a Sahelian climate and vegetation. Barren soils constitute some 25–30 percent of the surface, and erosion is a dangerous threat to agriculture. Agriculture in this environment is highly vulnerable to climatic variability and is also increasingly vulnerable to climate change which is especially threatening rural livelihoods and that of smallholder farmers in particular. Experience elsewhere (e.g. irrigation development, nucleus farmer-outgrower models, contract farming schemes etc.) has shown that schemes aimed at improving water management, developing irrigation, the introduction of HVCs, and linking farmers to markets require initial public support to finance the start-up costs, support the developing process, and lower risks. The role of the public sector in providing and co-financing the provision of modern technologies to disadvantaged smallholder farmers has also long been recognized.

Value added of the World Bank's support

86. The World Bank has wide knowledge and experience related to the design and financing of projects aimed at improving smallholder production systems and developing new value chains and linkages to markets, including in Africa and elsewhere. The World Bank also has experience with water management sector reforms in various countries. The experience obtained in other regions and countries can be usefully applied in Cameroon's northern provinces. The World Bank is also rapidly extending its knowledge about Climate Smart Agriculture, which is highly relevant, given the vulnerability of the northern region to climate change and food insecurity. The World Bank will provide technical and strategic knowledge transfer through the participation of specialists with ample experience in these areas while also sharing best practices in M&E.

[9] If prices of all products are reduced by 10 percent the ERR drops to 9.9 percent; if investment costs are 10, 20 or 30 percent over the current estimates the ERR drops to 11.2 percent, 9.9 percent and 8.8 percent respectively; if no post harvesting investments are developed, the ERR drops to 10.2 percent; and finally, if both prices of products are 10 percent down and investment costs 10 percent up simultaneously the ERR would be 8.8 percent.

87. **GHG Assessment.** A GHG assessment, using conservative boundary values, has been performed for this project using the FAO's EX-ACT. The results show that the project creates a total net carbon sequestration of -301,549 tCO_2-eq across the project's economic lifetime, with average annual net emissions of -15,078 tCO_2-eq and economic lifetime gross emissions of 400,309 tCO_2-eq.

B. Fiduciary

(i) Financial Management

88. The PIU that will be established and hosted by MEADEN will be responsible for overall coordination and implementation of the project, including FM aspects. Specifically, the PIU will: (i) ensure that funds are used for the purposes for which they were intended in an efficient and economic manner; (ii) correctly and completely record all transactions and balances related to the project; (iii) prepare the project's financial reports in an accurate, reliable, and timely manner; (iv) secure the project's assets; and (v) ensure that the project will be subject to auditing arrangements acceptable to the World Bank. In order for the PIU to fulfill these requirements, an experienced FM officer and one accountant will be recruited using the PPA to ensure they are on board no later than one month after effectiveness. A second accountant will be recruited later to handle the specific activities related to e-vouchers and matching grants activities.

89. The project will rely on the existing FM arrangements put in place to manage donor-funded projects. These arrangements are housed in two main institutions: (1) the Autonomous Amortization Fund *(Caisse Autonome d'Amortissement*, CAA) , which is equipped with dedicated tools developed by the World Bank's Institutional Development Fund (IDF). These tools include (i) a standardized FM Manual; and (ii) an integrated FM system for donor-funded projects (namely the Integrated system for Managing Disbursements (*Système Intégré de Gestion des Décaissement, SIGED)*, which includes modules relating to (a) the project cycle; (b) budgeting and accounting; and (c) automated payments, and electronic filing; and (2) the Ministry in charge of Government Procurement which is responsible for ex ante control of all suppliers' final invoices associated with a contract which must be exercised prior to payment by CAA.

90. In addition, and in light of the above, a seasoned FM officer will be recruited through the PPA. The following additional measures should be undertaken after the project becomes effective: (i) one seasoned accountant will be recruited, eventually completed with a second during implementation; (ii) the standardized FM Manual of Procedures developed by CAA with World Bank IDF support will be customized to reflect project specificities; (iii) the approval of the PIM was completed prior to the conclusion of negotiations; (iv) a specific Manual for the e-vouchers to farmers (disbursement condition under Subcomponent 2.1) will develop the e-voucher mechanism and will detail the management arrangements (beneficiaries' selection criteria, funds transfer conditions, management needs, etc.); (v) a specific Grants Manual (disbursement condition under Subcomponent 2.2) will be developed for the matching grants and will detail the management arrangements (beneficiaries selection criteria, funds transfer conditions, management needs, etc.); (vi) a simplified Irrigation Scheme Management Code (disbursement condition under the specific activities of Subcomponent 1.3) will be elaborated to detail the internal control procedures surrounding activities of the project with WUAs; (vii) a Scholarship Manual (disbursement condition under the specific activities of Subcomponent 3.2) will be elaborated to detail the mechanism and arrangements around the provision of scholarships to beneficiaries; (viii) an accounting software will be purchased and installed at the PIU to handle accounting and reporting needs under the project; (ix) an internal auditor will be recruited to conduct *ex-post* reviews of the project transactions and procedures, and to ensure that identified weaknesses are addressed in a satisfactorily manner; and (x) an external auditor will also be recruited to conduct an annual financial audit of the financial statements of the project along with a review of the internal control system, including that set up under Component 3.

91. The overall FM residual risk at preparation is considered High. The proposed FM arrangements for this project are considered adequate and meet the World Bank's minimum fiduciary requirements.

(ii) Procurement

92. Procurement for goods, works, non-consulting, and consulting services will be carried out in accordance with the procedures specified in the World Bank Procurement Regulations for IPF Borrowers dated July 2016, revised November 2017 and August 2018 (Procurement Regulations), the Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (revised as of July 1, 2016; Anti-Corruption Guidelines), and provisions stipulated in the Financing Agreement.

93. The proposed project will use the Systematic Tracking of Exchanges in Procurement (STEP) system. STEP is a procurement planning and tracking system that provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance.

94. A procurement assessment was carried out during the preparation of the project (see details in Annex 1). The procurement risks are high; key procurement risks under the project are as follows: (a) staff involved in the project may not have sufficient knowledge of the New Procurement Framework (NPF), and/or there is a risk of confusing NPF with former Procurement and Consultant's guidelines; (b) procurement staff with the experience required to effectively implement procurement actions on time, and in line with World Bank procurement policies and procedures are insufficient; (c) inadequate communication and interaction between beneficiaries and the PIU may lead to delays in procurement and poor cost projections; (d) administrative routines may result in procurement delays with the potential to impact project implementation; (e) the procurement in a specialized market with few bidders can restrict competition and possibly increase prices and collusion risks; (f) the corruption risks in procurement of big contracts taking into account Cameroon's Corruption Perception Index; and (g) poor filing which may lead to loss of documents. Overall, all these risks can cause mis-procurement, possible delays in evaluation of bids and technical proposals leading to implementation delays, poor quality of contract deliverables and reputational risks to the World Bank and the project.

95. A Project Procurement Strategy for Development (PPSD) and a Procurement Plan (PP) detailing the first 18 months of implementation were prepared. The PPSD has identified the appropriate selection methods, market approach, and type of review by the World Bank for the high-risk and high-value contracts that will be executed during the implementation of the project. The PPSD also describes the overall project operational context, market situations, implementing agencies capacity, and possible procurement risks. The PP sets out the procurement selection methods as well as prior and post review thresholds to be followed by the Borrower during project implementation in the procurement of goods, works, and non-consulting and consulting services. According to the scope, nature of the critical activities, and the market research and analysis undertaken, the procurement arrangements are packaged as follows: (a) Rehabilitation (1,000 ha) and Development (5,000 ha) of the RB irrigation scheme including construction of a dyke (15 km) along the Benue river for protecting the riverine population (US$71 million); (b) Development (5,000 ha) of the LB irrigation scheme including also the construction of a dyke along that shore of the Benue river (15 km) for protecting the riverine population (US$51 million). The one bid with a lots approach will attract and foster the participation of big reputable international firms through international competition using Request for Bidding (RFB), including Hands-on Expanded Implementation Support (HEIS) support to achieve a high rate of success of the contract closing, and (c) consulting service through international competition using the RFP document for Selection Based on Qualifications and Cost (QCBS) selection method with open international advertisement of request for Expression of Interest for the short list of qualified firms (US$6.8 million).

96. The final versions of the PPSD and PP were approved on May 26, 2020. During implementation, the PP will be updated as required, at least annually, to reflect actual project implementation needs and improvements in institutional capacity.

C. Environment, Social, and Legal Safeguards

97. **The project will support interventions designed to improve water security and agricultural production in the irrigated areas of the Benue Valley.** The project is located in natural and modified habitats and will have a footprint of more than 11,000 ha for the construction works and ancillary facilities. While 1,442 households will be economically displaced (by not having access to their irrigated lands while phase 1 is being rehabilitated), the project will positively impact many farmers.[10] Vulnerable groups will be impacted as well. During its peak construction period, the project will employ a workforce of nearly 500, with the potential impacts that such a population influx will have on the cost of goods and services, public security, and social cohesion. There has been population influx in the 1970s, when people migrated from the Far North and settled in Lagdo, and the progressive rehabilitation and construction of new irrigation schemes might generate additional population influx. This influx could result in pressure on resources, social organization, and the basic infrastructure that was originally designed for small villages. The project is a potentially significant user of water from a multi-purpose reservoir and will have transboundary and cumulative risks and impacts. A detailed water balance is planned to be developed in 2020/2021; it will be maintained, monitored, and reported on periodically.

98. **The project has been designated as a Category A (full assessment) project because it may cause adverse environmental and social (E&S) impacts that may be significant and irreversible.** The following factors were taken into consideration: (i) the scale of works (11,000 hectares) to be undertaken; (ii) new innovative technologies (there will be a different approach in irrigation systems for the right and LB, as well as a number of measures being introduced in Component 2 – like e-vouchers, grants, and CGER, WUA while well tested elsewhere, will relatively new in Cameroon); and (iii) some potential environmental issues associated with the construction and operation of irrigated perimeters, the expansion of the primary canal and the construction of the secondary and tertiary canals are cumulative and irreversible. These impacts include natural and modified habitats fragmentation within the project area; and changes to soil characteristics from the use of inorganic chemicals. The World Bank appraisal mission took place between February 17-22, 2020, and included meetings with E&S teams, meetings with local authorities based in Garoua and Lagdo, and meetings with affected communities in Lagdo and focal points of a cluster of affected villages.

99. **Policies.** The following OP/BP policies are triggered: Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04; Forests OP/BP 4.36; Pest Management OP 4.09; Physical Cultural Resources OP/BP 4.11; Involuntary Resettlement OP/BP 4.12; Safety of Dams OP/BP 4.37; and Projects on International Waterways OP/BP 7.50. The World Bank Group Environmental Health and Safety (EHS) Guidelines are also applied to this operation, and the application of these guidelines is tailored to the hazards and risks established on the basis of the results of the ESIA/ESMP (version February 2020).

100. **Environmental management instruments for the irrigation scheme.**

- **A preliminary ESIA/ESMP (version February 2020) has been conducted by an independent third-party international consultant, consulted upon, and disclosed on 24 February, 2020**, in the MINEPAT official portal, and in the World Bank website. Approximately 14 information and consultation meetings were held, where more than 2,470 people attended. The preliminary ESIA gives insights into risks, including GBV issues and possible costs. The preliminary ESIA was reviewed by the World Bank

[10] Different RAPs will provide precise information about the number of farmers affected.

and, as agreed with the Client, impacts, risks, and opportunities need to be further assessed. The following aspects will be considered: alternatives; cumulative impact assessment (CIA); quantified socioeconomic impacts; ESMP-Budget; ESMP for the operation phase; food security situation in the project area, including a food calendar; equitable access to irrigated lands and equitable shared benefits from production to avoid social disruption; an alien invasive species monitoring and action plan; the type of improvement services that will be delivered and how these will be delivered; etc.

- **ToRs for a full ESIA were prepared and consulted upon during December 17-19, 2018.** The scope of the ESIA includes irrigation schemes and ancillary facilities, such as access roads, borrow pits, and workers accommodation camps, among others. Public hearings will be organized by the Ministry of Environment, Nature Protection and Sustainable Development (MINEPDED) when the draft final ESIA/ESMP report is available. There is a feedback loop between the ESIA/ESMP, the engineering design processes, and the ESIA (especially alternative analysis, CIA, etc.) will not an be an afterthought. Findings of the final ESIA/ESMP for 11,000 ha that is grounded on detailed designs, including the public hearings, will be reviewed, consulted, cleared by the World Bank as disbursement condition and disclosed.

101. **Technical studies are underway, and the independence of the engineering design from the ESIA/ESMP process is firmed up through ToRs and contractual arrangements.** An international, independent consulting firm was contracted to prepare the ESIA/ESMP. The final ESIA/ESMP report is expected in September 2020. The VIVA Benue E&S budget dedicated to the ESMP implementation is in line with good international practice. Both firms, the one in charge of technical studies and the one in charge of the ESIA/ESMP, are exchanging data and information, and the inclusion of E&S considerations in the design process is ongoing. The design will, in turn, be informed by the findings of the ESIA/ESMP. The final ESIA/ESMP report, to be grounded on technical designs, will identify and assess environmental, social, and health impacts and critical risks so that:

- modifications can be made to the project to reduce E&S health risks and impacts;
- the conditions under which the project can proceed are made known; and
- management strategies can be put forward to reduce the significance of any environmental, social, and health impacts.

102. **Content of the final ESIA/ESMP for the irrigation scheme.** The final ESIA/ESMP report will *inter alia* cover: alternatives; CIA; quantified socioeconomic impacts; ESMP-Budget; equitable access to irrigated lands and equitable shared benefits from production to avoid social disruption; detailed water balance; public hearing findings; and mitigation measures will be proposed for each identified impact and will be synthesized in the ESMP. Examples of Management Plans to be included in the ESMP are: rice farming operation ESMP; Surface and Groundwater Quality Monitoring and Management Plan; Emergency Preparedness and Response Plan; Cultural Heritage Resource and Preservation Management Plan; Integrated Waste Management Plan; Occupational Health and Safety (OHS) Plan; Infrastructure Management Plan; etc. There is an emphasis on proper maintenance of the irrigation canals and surface drainage system; appropriate cropping patterns; limiting rice cultivation to clayey soil; improved water management and irrigation efficiency; avoidance of excessive wetting of the soil profile; and leaching to the subsoil. The final ESIA/ESMP for 11,000 ha, that is grounded on detailed designs, including public hearing findings, will be reviewed, cleared, and disclosed by the World Bank prior to as condition tendering the works of Subcomponent 1.2.

103. **Contractors will prepare Contractors' ESMPs** once they are in place and some specific activities and information about the construction are known (location of the camp, borrow-pits, etc.).

104. **For the other components, an ESMF has been prepared and disclosed in-country, and on the Association's website on December 5, 2019**. The ESMF sets methods and procedures, along with appropriate institutional arrangements for screening project activities to be implemented under Component 1 (such as the construction of dykes for 18 km downstream of Lagdo on both shores to protect riverine populations; construction of meeting rooms), Component 2 (Production and support to agriculture services including the matching grants) and Component 3 (creation of the Technical Innovation Center (TIC)/*Centre d'Innovation Technologique; CIT).* The ESIA for these subsequent activities will be prepared by an independent, third party consultant and not by the PIU itself, as this is a Category A project. The ESMF describes standard methods and procedures, along with appropriate institutional arrangements for screening project activities, reviewing, implementing, and monitoring specific ESIAs to prevent adverse risks and impacts, as well as cumulative impacts.

105. **A Pest Management Plan (PMP) has been prepared, was consulted upon and disclosed in-country on February 10, 2020 and at World Bank website on February 10, 2020.**

106.

107. **Based on the ESMF and preliminary ESIA (version February 2020), the residual E&S impacts after the mitigation measures are acceptable.**

108. **Social management instruments.** The social assessment and the Resettlement Policy Framework (RPF) were disclosed on February 10, 2020 through the MITADER and WB websites. The social assessment aims to analyze the local social context in terms of social organization, land tenure organizational features, and gender aspects and it will propose key actions to be undertaken in the framework of the project. The RPF sets compensation and resettlement principles to be applied for all land acquisition operations. Five other social instruments will be prepared and disclosed under this project, and they concern: (i) a RAP for 1,000 ha (RB of the Lagdo River) is expected during implementation; (ii) a RAP for the 5,000 ha (LB of the Lagdo River) is expected in late August 2020; (iii) a RAP for 5,000 ha (RB of the Lagdo River) is also expected in late August 2020; (iv) a Labor Influx Management Plan expected in early 2021; and (v) a Stakeholders Engagement Plan expected in early 2021. Additional key measures will be proposed in the ESIA and ESMPs to mitigate economic displacement during plots rehabilitation. Additional RAPs may also be prepared, for example if the construction of the dykes impacted land that is not from the Government. Impacted farmers will, for instance, be employed by enterprises during rehabilitation and development works. Specific arrangements will be included in tendering documentations (DAOs) to ensure that contractors effectively recruit those farmers. A list of those farmers will be included in the RAPs and made available for the contractors. The PIU will supervise the implementation of these measures by the contractors and the local councils.

109. **MEADEN will set up its E&S team to support the preparation, implementation, and monitoring of the ESMPs.** Qualified E&S specialists will be on the ground, and MEADEN's capacity will be strengthened throughout the lifecycle of the project. E&S mitigation measures linked to construction activities will be incorporated in the bidding documents and contractual arrangements. Contractors will have to submit their ESMPs as part of the tendering requirements. The ESMP will be revised, cleared, and adopted prior to the tender or commencement of construction works to ensure they have the capacity and procedures in place to manage identified E&S risks.

110. **During construction, mitigation measures at the construction sites will include standard construction pollution prevention and control measures**, such as: (i) solid and hazardous waste handling and disposal; (ii) domestic/camp wastewater treatment; (iii) storage and handling of hazardous materials; (iv) housekeeping; (v) control of erosion and storm water runoff; and (vi) noise, vibrations, and dust abatement measures, among others. These mitigation measures will be outlined by contractors for civil works in their ESMP (i.e. waste

management plans, hazardous materials management plans, and effluents management plans). Each contractor will produce a site-specific Occupational, Health, and Safety Plan and related procedures that refer to identifying and minimizing hazards to workers; providing appropriate equipment; identifying preventive and protective measures; training of workers; and documenting and reporting accidents, diseases, incidents, and near misses.

111. **Natural Habitats OP/BP 4.04.** The project is not located in any of Conservation International's Biodiversity Hotspot or High Biodiversity Wilderness Areas, or within an Endemic Bird Area. Downstream impacts: the development of irrigation infrastructure may affect areas requiring specific management considerations, such as wildlife migration corridors. The ESIA has conducted, in September 2019, (i) an inventory of the flora (including invasive species/weeds) and fauna (including aquatic fauna) to determine if endangered, endemic, or migratory species are present in the project area of influence. The preliminary ESIA/ESMP (version February 2020) report has identified and delineated areas of critical habitat and proposed generic mitigation in accordance with this policy for all project works. To ensure ecological continuity, continued long-term commitment is required for the collection of ecological and hydrological (flow/water level) data at key locations downstream of the reservoir.

112. **Forests OP/BP 4.36.** The project does not support commercial forest exploitation. However, this policy is triggered because the Massif Forest of Ouro-Doukoudje may be affected due to its location in the project's area of influence. Local stakeholders use this forested area for firewood, charcoal, non-timber forest products, and game hunting. The dominant vegetation type in the project area is comprised of a mosaic of natural grasslands with few trees scattered and grasslands created by anthropogenic influences such as clearing, overgrazing, and slash and burn. It is estimated that a total of 132,350 trees risk being cut down. This estimate is based on trees per ha, and these figures are the upper ceiling since certain engineering approaches could result in avoidance of tree cutting. The necessary mitigation measures, considering mitigation hierarchy and limiting the offset, are being considered and will be finalized as part of the ESIA/ESMP.

113. **Pest Management OP 4.09.** Major interventions are planned to enhance agricultural and water productivity, and this may lead to an increased use of pesticides and other agrochemicals. Some residual pesticides may affect water courses downstream. Most of the watercourses and existing cultivable fields are infested with aquatic weeds. This creates breeding grounds for insect pests both for agriculture and public health, in addition to snails which serve as vectors for parasitic flukes of man and livestock. Neglected areas are likely to serve not only as seed bank from which seeds are easily dispersed to the fields, but their weed flora could also serve as temporary host for many field crop pests when the principal host crop is out of season. To address pest and pesticide issues, vectors, and their associated diseases, a PMP was prepared, consulted upon, and disclosed on February 10, 2020. It proposes methods of weed control as part of an integrated control program that includes mechanical (including manual), ecological, chemical, and biological measures. It also recommended measures to reduce the risk of waterborne diseases to a minimum. The proper provision of drinking water and adequate sanitation and preventive health care measures are suggested. The inclusion of alternative and simple weed control methods to be applied to canals, ditches, and adjacent riverbanks of cultivable fields is also proposed.

114. **Physical Cultural Resources OP/BP 4.11.** Previous studies in the region revealed local significant heritage places such as graveyards. Mitigation measures are incorporated into the disclosed ESIA/ESMP report (version February 2020). Contractors will be contractually required to develop a chance find procedure as part of their ESMP, at least 30 days in advance before commencement of works.

115. **Involuntary Resettlement of Populations OP/BP 4.12.** The implementation of the activities of Component 1 related to infrastructure development and water management, and some activities of

Component 2 to improve agricultural production and services trigger OP/BP 4.12 (Involuntary resettlement of populations). This is justified by two scenarios in the framework of the project: (i) the rehabilitation and development of the perimeters envisaged in component will lead to economic displacements and loss of livelihoods; and (ii) the need to borrow and/or to get deposit sites for the rehabilitation/development of perimeters will result in temporary acquisitions of land belonging to either individuals or communities. All sites targeted for the various hydro-agricultural schemes and the development of agricultural production and processing are currently exploited by the populations for the needs of agricultural production and grazing.

116. To mitigate this impact, the Government carried out the following actions: (i) the availability of the list of PAPs and their compensation since 2010. In fact, during the socio-economic study of the project area in 2010, a total of 1,442 households had been recorded for 3,093 impacted properties (fields and houses). During the March 2018 World Bank mission, these PAPs told the World Bank team that they no longer claim anything from the Government in terms of compensation for the 1,000 ha of Lagdo I (RB), the 5,000 ha of Lagdo I area (RB), and the 5,000 ha Lagdo II area (LB); (ii) the availability of a resettlement site for PAPs being developed in Laïndé Lagdo village since 2011; and (iii) the availability for the Lagdo I and II perimeters of a Declaration of Public Utility (DUP established in 2001 and 2008), two Decrees of Incorporation established in 2010, and seven Land Titles established in 2011. Since issues on land could be sensitive, the TA supporting land allocation needs to explain and make transparent the process to update the rules of land allocation in the irrigation perimeters with all the stakeholders involved, in particular MEADEN, WUAs, and farmers' organizations, including those for women.

117. **Safety of Dams OP/BP 4.37.** The project does not finance the construction of dams. However, VIVA Benue would depend on water from an existing reservoir impounded behind the Lagdo Dam. The policy is triggered because the proper performance of this dam directly impacts the functioning of the World Bank-financed investments. In addition, this project will ensure long-term dam operation and safety. As required by OP 4.37, the Government hired an independent dam safety specialist to (i) inspect and evaluate the safety status of the existing dams, their appurtenances, and their performance history; (ii) review and evaluate the owner's operation and maintenance procedures (e.g. O&M, Instrumentation Plan, and Emergency Preparedness Plan (EPP); and (iii) provide written reports of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam to an acceptable safety standard.

118. The independent dam safety specialist prepared a dam safety review inception report and a dam safety assessment report and submitted them to the World Bank. The inception report presents the approach and methodology for the dam safety assessment and a summary of the site visit program. The dam safety assessment report confirms the general good conditions and behavior of the 40-year old dam. The latter is well operated/maintained and also monitored satisfactorily with the installed instrument. The recommendations of the dam specialist to ensure acceptable dam safety condition according to GIIP include (i) review and update of the hydrology and increase of the discharge capacity of the dam through the installation of fuse gates on the west saddle dam, if needed; (ii) rehabilitation of the spillway gates hoisting system; (iii) rehabilitation and upgrade of the dam monitoring equipment, including capacity building and training of the staff in charge of the O&M of the dam; (iv) inspection and repair, if justified, for operation or safety reasons, of both penstocks and bottom outlet tunnel; (v) other minor maintenance works to ensure the long-term integrity and safe operation of the dam and its appurtenant structures; and (vi) review and update of the dam safety plans (O&M Plan, Instrumentation Plan, and EPP). The investment will include the implementation of safety-related technical and non-technical measures necessary to upgrade the Lagdo dam to an acceptable standard of safety and to insure a safe operation of the structure. This also includes capacity building and training of the staff in charge of the O&M activities.

119. While the Government is ultimately responsible for the safety of the Lagdo dam, ENEO operates the

dam under a concession. ENEO structured a Corporate Social Responsibility Unit in 2010, which includes a Hygiene, Safety and Environment Central Unit. It also has an E&S policy (ESP #42 Rev 2 09/14) and has developed Safety and E&S performance standards for its operations. However, the ESIA process has assessed the technical capacity of ENEO at Lagdo Dam and regional levels to identify, flag, and manage any safety, environmental, and social related concerns to the Lagdo dam operation – power generation, irrigation releases, flood releases, and safety of the dam. The final ESIA, together with the Emergency Response Preparedness plans (ERP), will propose mitigation measures.

120. The project will finance the establishment of an independent dam safety panel, to assist the client in the implementation of the related dam safety measures, with specific ToR in accordance with Dam Safety Guidelines of the World Bank (OP 4.37). This panel will consist of a hydrology and hydraulics specialist, a dam monitoring specialist, and a hydromechanical equipment specialist. The ToRs for the independent dam safety panel were approved before negotiations, and the panel will be established by no later than March 31, 2021.

121. **Projects on International Waterways OP/BP 7.50.** This policy is triggered because the Benue river is shared by Cameroon and Nigeria, and is also a tributary to the Niger river, which is shared also with Benin, Burkina Faso, Chad, Cote d'Ivoire, Guinea, Mali and Niger. In line with its obligations under the 2008 Niger Basin Water Charter, the GoC sent a preliminary letter to the NBA on November 29, 2018, informing it about the VIVA Benue project. A formal notification letter was sent from MINEPAT to NBA on December 30, 2019, including a detailed project description along with the generic ESIA/ESMP report and engineering designs. This was done in accordance with the 2008 Niger Basin Water Charter signed by Cameroon and the other riparian countries. On March 11, 2020, a response was received from the NBA confirming no-objection to the project and that other riparian countries have been informed of the project. Since the NBA is mandated by the riparian countries to assess these notifications on their behalf, and each member country has at least one representative in the NBA, the World Bank considers the NBA procedure sufficient for the purposes of notification procedures in accordance with the Policy. Riparian notification has been carried out in accordance with procedures set out in the 2008 Niger Basin Water Charter signed by Cameroon and the other riparian countries. The regional vice president approved the completion of the process on April 13, 2020.

Institutional Arrangement for Safeguards Management

122. MEADEN does not have an environmental management unit or the necessary expertise to manage E&S risks without external technical support. Going forward, this needs to be established and strengthened. This would entail, among others, development of institutional protocols and work procedures for environmental management, health and safety practices, weeds control, waste and hazardous materials management, stakeholder engagement, etc. To manage E&S issues, MINEPAT has recruited two safeguards specialists (E&S) during the preparation phase. The PIU staff will include two qualified E&S specialists, who will be based in Lagdo and will play an active role in the management of the project's E&S risks and mitigation measures and ensuring the implementation of an effective stakeholder engagement strategy and grievance mechanism. The PIU staff will remain on-site for the duration of construction, ensuring continuous engagement with communities.

123. **Supervision Engineers (Component 1).** The PIU/MEADEN will recruit a qualified consulting firm as supervision engineers to ensure that execution of works by contractors comply with established cost, quality, delivery deadlines, as well as compliance with EHS contractual requirements. Supervision engineers will retain one EHS specialist/engineer and one EHS Inspector at least throughout the project construction phase to monitor contractors' EHS performance, and one Social Specialist to monitor social safeguards, including GRM and gender performance.

124. **Contractors.** All contractors (including Contracting in Employment-intensive Works) will proportionally appoint their own OHS personnel for the implementation of their ESMPs and OHS, and their own social personnel for the implementation of social aspects of the ESMPs. The Contractors are unknown at this point. However, their selection criteria will include past E&S performance as well as adequacy of contractor's staff to effectively put mitigations in place. Contractors shall be required to develop Contractor's ESMP as part of the bidding process.

125. **Rice farmers, WUAs, and other beneficiaries.** Rice farmers and WUAs may have inadequate capacity to effectively implement the ESMF requirements under Component 2 and mitigation measures included in the ESIA/ESMPs for Component 1. An environmental, health safety, and social focal point will be proposed by each WUA. Designated focal points responsible in the long run for implementing the environment, health workplace safety, and social requirements in the cultivable fields and during postharvest activities, will attend training on ESMF/ESMP implementation and good practices for the protection of the environment, including water, energy, soil health, biodiversity and pest ecology management, and to manage grievances and GBV issues. In addition, the project will provide farmers with training and TA.

126. **MINEPDED/Divisional Committee.** Cameroon has stable E&S institutions, namely MINEPDED, the Ministry of Domain, Cadastral and Land Registration Affairs, and the Ministry of Socials Affairs, which are the central ESIA authorities. The country has also a comprehensive E&S legal framework, including the 1996 Environmental Law and its implementation decrees. Any project for which an environmental assessment is carried out, is subject to the administrative and technical supervision of the respective authorities. This supervision focuses on the effective implementation of the ESMP included in the ESIA. The Order No 0010/MINEP of April 3, 2013, requires a setup in each Division of the country as well as a Committee for the technical and administrative supervision of ESMPs. However, these committees are not operational as they do not have adequate financial provision and a permanent budget for external oversight of ESMPs and they are not fully integrated into the Ministry's planning process. The project will bear the costs associated with the operation of the different Divisional Committees in charge of monitoring ESMPs in the project areas.

127. **The project was rated as having a substantial risk of GBV and Sexual Exploitation, Abuse and Harassment (SEAH);** therefore, it is following the recommendations of the Good Practice Note on Addressing GBV in Investment Project Financing involving Major Civil Works. It will develop a GBV/SEAH action plan by October 2020 with accountability and response framework that will be reflected in the Grievance Redress Mechanism (GRM) for the project, specifying how GBV/SEAH complaints will be treated ethically, safely, and confidentially and in accordance with guiding principles for survivor care, with response protocols that include a mapping of locally available structures that offer quality services. The framework will include community consultations and an awareness-raising strategy to sensitize personnel and local communities around GBV/SEAH risks and mitigation measures, ensuring that community consultations with women will be conducted in safe and enabling environments, such as in sex-segregated groups and with female facilitators. The GBV/SEAH action plan will foresee an inclusion in all contractual documents, a section on GBV/SEAH with proposed mitigation measures as well as a section in the code of conduct to manage the question of labor influx and with clear language on unacceptable behaviors, including GBV/SEAH, as well as clear sanctions for those who do not respect these codes.

128. **The PIU will have to identify the precautionary measures for the management of migrant influx in the project area, identify measures to ensure security around the perimeters, remove and materialize elephant migration corridors as well as corridors of transhumance of the perimeters to be developed.** It is anticipated that around 500 workers (200 on the LB and 300 on the RB) will be mobilized for field operations. This could lead to risks related to labor and working conditions. Key measures and rules will be integrated in

bidding documents to ensure that work conditions are aligned with the national regulations and the World Bank's guidelines in terms of GBV, child labor, and wages.

129. **Improved EPPs would be prepared using up-to-date maps and technology**. Groundwater potential maps will also be produced for areas where unsustainable use is a risk.

130. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

V. KEY RISKS

131. **The project's overall risk rating is High**. Political and governance, macroeconomic, fiduciary, E&S risks are assessed as High. Several other risks are considered Substantial, including sector strategies and policies, technical design, institutional capacity for implementation and sustainability, stakeholders, and other risks.

132. **Political and governance risks are High,** including given the challenging security situation in the North as well as the Western part of the country. There are further risks from limited Government capacities as well as some recent observed radicalization of the political process; elite capture may increase these risks. The PIM was completed prior to the conclusion of negotiations, together with the various planned manuals, which will specify who is eligible and who will not be eligible to receive project support (e.g. Government officials and their kin), and that names of all beneficiaries of matching grants will be published. Supervision missions will closely look at the beneficiaries and request a third-party monitoring/surveillance if necessary.

133. **Macroeconomic risk is rated High**. The medium-term outlook is extremely challenging as the COVID-19 pandemic deteriorates global and regional economic environments and has resulted in a large decrease in the price of oil. The current situation was preceded by a deterioration of Cameroon's fiscal and external balances between 2014 and 2016, challenging macroeconomic stability and exposing the country's vulnerability to oil prices despite its relatively diversified economic base. A further unanticipated widening of the fiscal deficit would put pressure on the Government to reduce spending on key programs in sectors such as agriculture, health, and education; which might affect project implementation security operations on the borders and in North West and South West are expected to drive public expenditure up in 2020 and beyond. The World Bank recently financed a DPO (P166694; FY20) to address some of these risks by promoting growth-enhancing measures and creating incentives for the private sector. It is also preparing the Cameroon COVID-19 Preparedness and Response Project (P174108) for US$ 29.0 million expected to be approved in August 2020 and to be concluded in June 2022, using the multiphase programmatic approach (MPA).

134. **Risks related to Sector Strategy and Policy are rated as Substantial (after mitigation measures including a Development Policy Letter (Annex 6) with specific actions).** Reasons for the existing (unmitigated) High risks include absent, weak, and/or contradictory legislation and regulations, along with various distortions, which have limited private sector development.

- **A central risk for project success is that there is no legal framework for the creation of WUAs**, which are to be responsible for tertiary canals of the project. As a mitigation measure to reduce the risk from High to Substantial, specific proposed, time-bound actions need to be undertaken. The main mitigation measure in the event that the legislative development process stalls would be the requirement in the standard *cahier des charges* (conditions) applicable to land plots in the irrigation schemes that each landholder participate in the management of the irrigation scheme by becoming a member of an entity established by the land holders to that end (i.e. the WUA) that is responsible for the operation and maintenance of the infrastructure transferred to it and for the collection of mandatory irrigation fees. This will be done by a Ministerial Decision from MINADER approving the management rules for irrigation schemes in the Adamawa, North and Far-North regions.
- **A second key problem under this risk category relates to land tenure and allocation of public land.** A first land issue risk is linked to a lack of transparency or misunderstanding about the process on land management in the irrigation scheme. The sensitiveness could concern both the allocation process (which criteria and how these criteria have been identified) and the land contract update. So far, people have been given a certificate of attribution. Based on experiences in similar contexts in other Sahelian countries, including projects supported by the World Bank, a key mitigation measure is to make all the land right activities as transparent as possible with clear communication with beneficiaries, PAPs, and all the stakeholders involved, including publishing information indicating to whom land has been allocated. Also, the project will rehabilitate an existing irrigation scheme and develop a new one in the same area; therefore, the two processes have to set up similar legal rules and avoid discrepancies and creating unfair conditions between people in similar situations. Another risk, not uncommon, is regarding potential elite capture during or after the project in the project area. Elite capture has already been identified as an issue. Specific actions will be undertaken to mitigate that risk including publishing the names of all new owners.

135. **Technical design risk of the Project is assessed as Substantial.** A dam, reservoir, and a primary canal already exist; therefore, the expansion of the primary canal and the construction of the secondary and tertiary canals should not represent a significant technical challenge. However, the different approach in irrigation systems for the RB and LB – some with innovative technologies, as well as a number of measures being introduced in Component 2 – like e-vouchers, grants, and CGER, while well tested elsewhere, are relatively new in Cameroon. Third, some experiences exist with matching grants; nevertheless, there will be challenges to its effective, fair implementation. Therefore, a private sector specialist will be recruited into the PIU to help manage this.

136. **Risks related to Institutional Capacity for Implementation and Sustainability are assessed as Substantial.** Institutional capacities for project implementation are weak; therefore, the project will use a PIU and also strengthen MINEPAT and MEADEN (during the course of the project after a transformation plan has been prepared). No later than 6 months after effectiveness, in order to reduce these risks, MEADEN will provide to the World Bank a detailed reorganization plan for clearance with clear objectives, actions, responsibilities, timing, and costing for a three-year implementation with clear milestones. During project implementation, the World Bank will monitor the plan and review the milestones in order to provide the proper support. During the Mid-term Review, the implementation of the reorganization plan will be assessed and corrective measures will be taken, if necessary. There is also a risk that financial institutions may have difficulties to lend to match the project's partial grants, given their limited access to long-term resources which are necessary to on-lend for investments. Other specific risks and proposed mitigation measures are as follows: the lack of reliable data may limit information on project performance during implementation; a Management and Information System (MIS) would therefore be established to improve data collection (including for gender and youth) during

project implementation. To mitigate the risk related to the financial institutions' participation in the matching grant scheme, the project will work with financial institutions which are stable and have some experience with funding under a matching grant approach in the agriculture sector.

137. **Fiduciary risk is rated High**, given the fact that the project will implement some specific mechanisms, e-vouchers, matching grants and scholarships, which complexify the fiduciary processes to be put in place. This is accentuated by the lack of experience of the MEADEN in implementing fiduciary requirements in World Bank operations, by the fact that fiduciary staff are not yet in place, and the fact that the project will implicate many new/reorganized entities (WUAs, Special Committees, producers' organizations and cooperatives, private sector, etc.) with low capacity in fiduciary-related matters. To mitigate those risks, a PIU will be set-up and hosted by MEADEN and experienced fiduciary staff will be hired. The project will finance significant implementation support to the PIU and to MEADEN. In addition, the World Bank team will closely monitor procurement and FM aspects of the project.

138. **Environment and Social (E&S) Risks are High**. The overall E&S risks are rated High, given the scale of works (11,000 hectares) to be undertaken. In addition, some potential environmental issues associated with construction and operation of irrigation schemes are irreversible, permanent and cumulative. These issues include natural and modified habitats fragmentation within the project area, changes to soil characteristics from the use of inorganic chemicals, creation of breeding grounds for malaria vectors, in addition to snails which serve as vectors for parasitic flukes of man and livestock. According to the results of the social assessment, the main potential social risk of the project is a lack of transparency and equity in the allocation of plots in the rehabilitated perimeters for the social groups established in the Lagdo area with potential risk of conflicts; this may hinder the implementation of the project.

139. To mitigate these potential E&S risks, the Government (i) has started performing E&S due diligence that has resulted in the development of an Environmental and Social Management Framework (ESMF) and RPF for activities to be undertaken under Components 1 and 2; and (ii) an ESIA (version February 2020) and a PMP were also prepared, and they brought to light major E&S issues and proposed mitigation actions and measures.

140. Even though experience and capacity for designing and implementing E&S safeguards measures have been acquired from the PULCI project, the GoC has capacity limitations and might not satisfactorily ensure a thorough safeguards compliance monitoring. To ensure that GoC and World Bank Group's E&S safeguard standards are met, the World Bank team has included resources for the recruitment of two safeguards specialists as well as the costs associated with the operation of the different Divisional Committees in charge of monitoring ESMPs in the project areas.

141. GoC and the World Bank have agreed on an approach to support PAPs during the rehabilitation and development of the perimeters and for the allocation of plots in the perimeters to be rehabilitated. This approach is based on the experience of MEADEN. PAPs will be recruited as a priority in labor-intensive work (HIMO). With regard to the allocation of plots, GoC would like the existing beneficiaries to be reappointed to their respective plots (after the rehabilitation) in the portion of the 600 ha that had been awarded in the Lagdo I area.

142. **Other risks**: Health. This risk is considered Substantial for the Lagdo area. There could also be health effects due to waterborne diseases along with the expansion of irrigated areas. The project will need to carefully follow this and take remedial actions where feasible. Further, Cameroon has a high number of COVID-19 infections, with 18,213 confirmed cases and 398 deaths as of August 12, 2020; this also requires attention. In particular, it is important and urgent to update the Government's National COVID-19 Preparedness and Response Plan.

VI. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY: Cameroon
CAMEROON – VIVA BENUE PROJECT

Project Development Objectives(s)

The Project Development Objective (PDO) is "to provide sustainable irrigation and drainage services and improve agricultural production in the irrigated areas of the Benue valley."

Project Development Objective Indicators

Indicator Name	DLI	Baseline (2020)	Intermediate Targets						End Target (Year 7)
			1	2	3	4	5	6	
To increase agriculture productivity									
Total area irrigated (hectares)		1,000	0	0	5,000	11,500	13,000	14,000	14,400
Irrigation scheme management transferred to Water Users Associations (hectares)		0	0	0	3,500	8,000	10,000	10,000	10,000
Area prepared by private sector (hectares)		100	0	0	3,500	8,500	11,500	13,000	14,400
Value of agricultural production in rehabilitated and improved irrigation area (CFA million/year)		720	0	3,256	26,570	55,677	76,700	90,740	90,740

Indicator Name	DLI	Baseline (2020)	Intermediate Targets						End Target (Year 7)
			1	2	3	4	5	6	
Direct beneficiaries (number)		0	1,000	5,000	10,000	15,000	20,000	26,000	26,000
of which females (percentage)		0	20	25	30	30	30	30	30

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline (2020)	Intermediate Targets						End Target (Year 7)
			1	2	3	4	5	6	
Component 1: Improvement of Infrastructures and Water Mangement									
Number of hydromet stations installed and functioning		1	1	1	2	6	8	8	8
Linear corridor flood alert system (km)		15	15	15	100	150	250	250	250
Area provided with new/improved irrigation or drainage services (ha)		600	0	3,500	8,000	10,000	10,000	10,000	10,000
Number of established WUAs (for secondary canals)		0	0	5	12	27	27	27	27
Women in decision-making positions in WUAs (percentage)		0	0	0	7	15	20	26	26

Indicator Name	DLI	Baseline (2020)	Intermediate Targets						End Target
			1	2	3	4	5	6	(Year 7)
Component 2: Production and Support to Agricultural Services									
Amounts of total vouchers (US$ million)		0	0	1.5	3.0	5.0	7.0	8.5	8.5
of which females (US$ millions; at least 30 percent)		0	0	0.45	0.9	1.5	2.1	2.55	2.55
Number of farmers reached with vouchers		0	0	2,000	7,000	9,000	13,640	13,640	13,640
of which females (percentage		0	0	20	25	30	30	30	30
Number of organizations having subscribed with the CGER		0	0	30	80	150	200	300	500
of which female		0	0	10	27	50	70	120	200
Number of business plans financed		0	50	550	1200	2000	2100	2600	2600
Business plan financed with female proponents (number)		0	15	60	165	600	630	780	780
Total amount of business plans financed (US$ million)		0	0	0.5	1.5	4.3	8.5	9.2	9.5
of which for women proponents (US$ million; at least 30 percent)		0	0	0.15	0.45	1.3	2.1	2.8	2.85
Cropping intensity (annually harvested area divided by irrigated area)		1.7	0	1.7	1.75	1.8	1.8	1.8	1.8

Indicator Name	DLI	Baseline (2020)	Intermediate Targets						End Target
			1	2	3	4	5	6	(Year 7)
Component 3: Capacity Building and Implementation									
MEADEN restructured (Percentage)		0	50	80	100	100	100	100	100
Number of people that has received training at the Technical innovation centers		0	0	50	200	350	500	600	600
of which females (percentage)		0	0	20	25	30	30	30	30
Number of beneficiaries who have received technical and vocational training		0	50	200	400	600	800	1,000	1,000
of which female		0	13	50	100	150	200	250	250
Number of people that has received training at a High-level education		0	0	10	20	30	30	30	30
Of which females (percentage)		0	0	20	25	30	30	30	30
Citizen engagement indicator: Monitoring of the Grievance Redress Mechanism (percent satisfactory resolution)		70	75	80	85	85	90	90	90

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility fo Data Collection
Total area irrigated (hectares)	This indicator measures the hectares that are irrigated every year.	Twice a year at the end of each crop	PIU progress reports	At the end of every cropping season; surveys administrated with	PIU

				representative sample of targeted project beneficiaries	
Irrigation scheme management transferred to Water Users Associations (hectares)	The network of canals and drains that command a certain area having their operation and maintenance transferred from MEADEN to the WUAs	Yearly	PIU progress reports	As transfers to WUAs involve legal documents, the total areas legally transferred for irrigation management from MEADEN to WUAs.	PIU
Area prepared by private sector (hectares)	This indicator measures the extent to which private sector enterprises have prepared (ploughed or harrowed) the land	Twice a year at the beginning of planting	PIU progress report	At the end of every cropping season surveys administrated with representative sample of targeted project beneficiaries	PIU
Value of agricultural production in rehabilitated and improved irrigation areas (millions of FCFA)	This indicator estimates the total value of production based on a sample of beneficiaries	Twice a year	PIU progress reports	At the end of every cropping season surveys administrated with representative sample of targeted project beneficiaries	PIU
Number of direct beneficiaries	This indictor measures the direct beneficiaries (disaggregated by gender) from irrigation and drainage services	Yearly	PIU progress report	Yearly estimates	PIU
Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility fo Data Collection**
Number of hydromet stations installed and functioning	Number	Yearly	PIU progress report	Yearly assessment	PIU
Linear corridor flood alert system (km)	Functioning alert system	Yearly	PIU progress report	Yearly assessment	PIU

Area provided with new/improved irrigation or drainage services (hectares)	Total area of land provided with new or improved irrigation or drainage services in operations supported by the World Bank. The breakdown of the indicator includes: (i) the area provided with new irrigation or drainage services (ha); and (ii) the area provided with improved irrigation or drainage services (ha)	Yearly	PIU progress report	Progress report by the Consulting Engineer of works in Subcomponent 1.2	PIU
Number of established WUAs	WUAs that have been legally established for irrigation management of a certain command area (usually a secondary canal)	Yearly	PIU progress report	Progress report by the consulting firm in charge of Subcomponent 1.3	PIU
Women in decision-making positions in WUAs	Number of women that are part of the WUA, responsible for structures (at least one for each WUA at secondary level canal)	Yearly	PIU progress report	Yearly assessment	PIU
Farmers reached with vouchers	Number of farmers (disaggregated by gender) who were provided with vouchers from the project	Twice a year	Twice a year surveys administered with representative sample of targeted project beneficiaries	PIU	PIU
Amounts of total vouchers (US$ million) disaggregated by gender	Amounts private sector enterprises have prepared and seeded rice and/or other crops	Yearly	PIU progress report	Yearly surveys administrated with representative sample of targeted project beneficiaries	PIU

Number of business plans financed	Number	Yearly	PIU progress report	Yearly assessment	PIU
Total amounts of business plans financed (US$ million) disaggregated by gender	Amount	Yearly	PIU progress report	Yearly assessment	PIU
Number of organizations having subscribed with the CGERs	Number	Yearly	PIU progress report	Yearly assessment	PIU
Cropping intensity	Annually harvested area divided by irrigated area	Yearly	PIU progress report	Yearly assessment	PIU
MEADEN reorganization (percentage)	Percentage based on the number of relevant restructuring actions taken	Semi-annually	PIU progress report	Assessment	PIU
Number of beneficiaries (disaggregated by gender) who have received training at the Innovation Training Center	Number	Annually	PIU progress report	Assessment	PIU
Number of beneficiaries (disaggregated by gender) who have received technical and vocational training	Number	Annually	PIU progress report	Assessment	PIU
Number of beneficiaries (disaggregated by gender) who have received higher education training	Number	Annually	PIU progress report	Assessment	PIU
Citizen engagement indicator: Monitoring of the Grievance Redress Mechanism (GRM)	Percentage of complaints treated and resolved to the satisfaction of the complainants	Annually	PIU Progress report	Registers of the grievances and complaints received and treated through GRM	PIU

ANNEX 1: Implementation Arrangements and Support Plan

A. Project Institutional and Implementation Arrangements

1. **Project Oversight**. The CAA will manage the Designated Account (DA) and will submit withdrawal applications to IDA on behalf of the Project. Overall responsibility for project implementation will be delegated to the MEADEN, which is therefore the Project Implementation Entity (PIE). The project implementation mechanisms will comprise of a PSC and a PIU under MEADEN.

2. The PSC would be responsible, *inter alia*, for (i) for approving the annual work plans and budget for the project prepared by the PCU; (ii) to give strategic orientations; (iii) to supervise the overall performance of the project; (iv) to identify, in relation to the donor, the necessary adjustments according to the state of implementation and results; and (v) contribute to the timely mobilization of counterpart funds. It will be chaired by a high-level representative of MINEPAT (General Secretariat; GS) assisted by two Vice-presidents (GS MINADER and GS Ministry of Water and Energy *(Ministère de l'Eau et de l'Energie*, MINEE). The members of the said committee are composed, among others, of (i) representatives of MINEPAT, MINADER, Ministry of Public Works (*Ministère des Travaux Public*, MINTP), Ministry of Economy and Finance (*Ministère de l'Économie et des Finances*, MINEFI), MINEPDED, MINEE, Ministry of Lands *(Ministère des Domaines, du Cadastre et des Affaires Foncières, MINDCAF),* CAA, Governor of the North region, MEADEN, the Project Coordinator, (ii) a representative of the Management and Maintenance Committees of the Hydraulic Network (WUA/CGERH) of the LB and one of the RB. The secretariat is provided by the project. The PSC will meet at least once a year.

3. At the regional level (North), MINEPAT creates and implements a Regional Technical Monitoring Team *(Groupe Régional du Suivi et Technique, GRST)*, chaired by the Governor and having as members the regional representatives of the ministries concerned and representatives of CGERH and Cooperatives. The GRST meets at least twice a year, and its main task is to provide technical support to the PSC.

4. At the departmental level, in addition, there is a Commission to assess and monitor the GRM. It is chaired by the prefect of *Bénoué* and, as necessary, it will manage complaints at the highest level. This Commission, which brings together most of the departmental delegates from the ministries, works in collaboration with the local grievances' management committees (collection and processing of requests).

5. Government counterpart funding will cover the costs of the (i) Steering Committee; (ii) the Regional Technical Committee; (iii) the Special Tender Board; (iv) any costs (including per diems) related to the carrying out of site visits, and follow-up and supervision missions and similar; and (v) any other costs required for project implementation that are not eligible for financing by IDA (e.g. payments of government civil servants, such as MEADEN staff). In the event that counterpart resources are not available for critical joint missions, whether for support, supervision or mid-term review, these could be financed by project funds after approval by the World Bank.

6. **Implementation**. MEADEN ensures the sustainability of the infrastructure in the Lagdo Valley. MEADEN is a public institution established on the basis of the 1999 Law on Public Institutions and Public and Parastatal Companies. Originally established as the Study Agency for Improving the Benue Valley (*Mission d'Études pour l'Aménagement de la Vallée Supérieure de la Bénoué)*, its name and objectives were changed by decree in 2002 to embrace the development of the entire North Region. In other words, the scope of activities of MEADEN extends beyond the Benue valley.

7. The 2002 decree was recently revised so as to slightly modify MEADEN's mandate and also to strengthen the legal provisions on its internal governance. The mission of MEADEN, which remains the same, is the 'harmonious development of the Northern Province'. As a State structure working under the technical supervision of the Ministry of Economic Affairs, Programming and Regional Planning (MINEPAT), the mission of MEADEN is the development the territory of the Benue valley. The stated mission of MEADEN includes: (i) the establishment of periodic regional development plans and sectoral components; (ii) the identification, definition, and preparation of development projects in the North Province; (iii) the planning, monitoring, and evaluation of projects; (iv) the promotion and development of available land in accordance with the regional development plan; and (v) the management of a GIS. MEADEN presently has 47 staff, all of whom are men, including eight university graduates, currently being expanded to 12 under the MINEPAT budget, to cover engineering and administrative functions. An effort will be made to increase the percentage of women in MEADEN during the course of the project to at least 15 percent. The annual budget is about US$0.5 million per year for operations and US$0.1 million per year for investment.

8. **Implementation schedule.** The proposed project would be implemented over a 6-year period, with a closing date of June 30, 2027. The contracts for the identified infrastructure works are all expected to be signed during the first 12 months of implementation.

B. Financial Management and Disbursements

Table 1.1: Assessment Table and Mitigation Measures of Project Risks

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Risk after Mitigation Measures
Country level Governance is widely acknowledged to be weak and may negatively impact the achievement of the development objectives of programs and projects implemented.	H	Donors community actions are oriented toward a PFM reform agenda in support of the Government's commitment to tackle cross cutting issues of governance and public resource management. In addition to investment support operations, budget support is being used to accelerate the pace of the PFM and governance reform agenda.	H

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Risk after Mitigation Measures
Entity level MEADEN has no previous experience in managing World Bank-funded operations, and the new PIU within MEADEN is yet to be established and capacitated with the potential to support Project readiness. In addition, the quite important legal and institutional framework amendments required for the project activities may lead to implementation delays.	H	The PIU will be created within MEADEN (implementing entity) not later than four months after project effectiveness and staffed with a seasoned team. No later than six months after effectiveness, MEADEN will provide to the World Bank a detailed reorganization plan for clearance; the implementation of that plan will be monitored throughout the life of the project. An internal control system will be built to address coordination issues consistent with an implementation manual that will clearly define roles and responsibilities and provide clarity on the reporting lines.	S
Project level The project is composed of 67.5 percent of rehabilitation works and includes e-vouchers, matching grants and scholarships, that may imply a risk of fraud and corruption. The project implies a reorganization of MEADEN with completely new roles and responsibilities for MEADEN and the creation of WUAs, and the implication of municipalities and producers' organizations. That may contribute to potential complexity in implementation and coordination of activities.	H	Internal control will be premised on the agreed PIM to ensure that the project is implemented in accordance with accepted procedures and a clearly defined allocation of duties. Separate Manuals for the E-vouchers, Matching Grants, Scholarships and WUAs will define arrangements, and will be disbursement conditions under the related categories. Roles and responsibilities for each stakeholder will be clearly defined. A steering committee presided by MINEPAT will be established to ensure overall coordination, cohesion, and strategic oversight over the project activities (ensuring strategic oversight, facilitating collaboration and buy-in among the different players, and endorsing major decisions of the project).	H
INHERENT RISK	H		H

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Risk after Mitigation Measures
Budgeting Delays may occur in budget preparation, with the potential for deviation from intended budget execution for some components or even not executed (not disbursed) as this may lead to not inclusion in the finance law. The project might experience delays in the budget preparation process as it will consider several entities' needs and budgets (WUAs, producers' organizations, MEADEN, etc.) and several activities not yet fully defined.	H	The standardized Project Procedures Manual will be adopted no later than two months after effectiveness and will be customized to provide a clear timeline and responsibilities for budget preparation, consolidation and monitoring. Simplified FM manuals will be prepared for activities with WUAs, producers' organizations, and other related parties. Project management will be clearly briefed/trained on the budget preparation and execution requirements, and to ensure ownership for an appropriate implementation. The budget will be prepared and approved early enough to ensure it is taken into account in the finance law.	H
Accounting effectiveness Arrangements for the establishment of the PIU have been made but need to become operational with FM staff. Also, the accounting software needs to be purchased and installed. As a consequence, the project may experience delays in the recording of the financial information and the analysis of the financial information. Due to the geographical position of the PIU, there may be a lack of competent and experienced FM staff interested. As a consequence, the recruitment process may be longer, and the project may experience delays to be declared effective.	H	The PIU will be established no later than four months after effectiveness, with FM staff in place, based on ToR acceptable to IDA to ensure the team is familiar with World Bank FM procedures and will properly handle accounting and reporting needs under the project, using appropriate accounting software. Particular logistic arrangements will be made, and remuneration of staff will take into account their geographical location.	S

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Risk after Mitigation Measures
Internal Controls Internal control systems are yet to be fully established and might lack appropriate segregation of duties and a clear description of roles. Control procedures to ensure selection of appropriate beneficiaries of grants and to ensure effectiveness and efficiency of WUAs' activities may be lacking.	H	The overall PIM has been completed and approved; internal control through separate manuals for the e-vouchers, the matching grants and the scholarships mechanisms, will detail management arrangements, flows of funds, roles and responsibilities, tasks, and controls to put in place for those activities. In addition, a Project's Procedures Manual (Administration, Finance and Accounting) will include a clear description of the system for internal controls, including the roles and responsibilities of actors. An internal auditor will be recruited to conduct *ex post* reviews of the Project transactions and procedures and ensure that identified weaknesses are addressed in a satisfactory manner.	H
Funds Flow As there is not yet a single dedicated account for the project, there is a risk that project funds are being diverted and used for non-project purposes, e.g. funds may be mistakenly advanced in DAs of other projects, as all the DAs are opened and managed by CAA in Cameroon. Flow of funds to e-vouchers and grants' beneficiaries may be delayed due to inadequate arrangements or the disbursement conditions on those categories may not timely satisfied.	S	Two DAs, one for the e-voucher and matching grants mechanisms (Subcomponents 2.1 and 2.2) and one for the other project activities, will be opened in a commercial bank acceptable to the World Bank and managed by the CAA and procedures for their management and control will be established and described in the disbursement letter and in the procedures' manual. The project may open transactions accounts to finance its day-to-day transactions. Specific flow of funds arrangements will be designed for the e-voucher, matching grants and scholarships mechanisms and specified in the dedicated manuals.	S

Risk	Risk Rating	Risk-Mitigating Measures Incorporated into Project Design	Risk after Mitigation Measures
Financial Reporting Delays in the submission of agreed IFRs and annual Project financial statements are possible due to the lack of accounting software and/or inexperienced staff.	S	The accounting software will be procured, installed, and customized at the PIU to ensure timely recording of financial information as well as timely production of in-year and annual financial statements. The reporting scheme will be clearly defined in the manual. Competent and experienced FM staff will be hired.	S
Auditing The project's financial statements might not be audited as there is no an auditor recruited for the project. In addition, the national audit entity, the Chamber of Account might not be able to carry out an audit based on a ToR acceptable to IDA.	S	An external auditor will be recruited in line with ToRs acceptable to IDA.	S
CONTROL RISK	H		H
Overall FM risk	H		H

Note: H = high; L = low; M = moderate; S = substantial.

9. The residual FM risk is deemed High, while the mitigation measures should lead to lower it to Substantial or Moderate. This is justified by the fact that, based on the country environment and the knowledge on MEADEN resulting from the FM assessment, the capacity of MEADEN to implement the proposed mitigating measures is not guaranteed, specifically in relation to timely and quality budget preparation, execution and monitoring, to timely and adequate staffing, to timely and quality production of the project's implementation and procedures' manuals, and to internal audit function. The FMS will provide appropriate capacity building to support MEADEN in the implementation of the mitigation measures, and the FM risk will be reassessed during the project implementation.

Table 1.2: Financial Management Action Plan

Action to be Undertaken	Time-frame	Responsible Body
Recruit an FM officer based on ToR acceptable to the World Bank	No later than four months after project effectiveness	PPA Unit (PULCI) /PIU
Prepare the PIM	Completed	PPA Unit (PULCI) /PIU
Prepare the e-vouchers manual	Disbursement condition under the related category	PPA Unit (PULCI) /PIU
Prepare the grants manual	Disbursement condition under the related category	PPA Unit (PULCI) / PIU
Procure and install an accounting software to handle accounting and reporting needs under the project.	No later than four (4) months after effectiveness	PIU

Action to be Undertaken	Time-frame	Responsible Body
Recruit an accountant based on ToR acceptable to the World Bank.	No later than four (4) months following effectiveness	PIU
Customize the standardized project FM procedures to reflect the project specificities	No later than two (2) months after effectiveness	PIU
Recruit an internal auditor to conduct *ex-post* reviews of the project transactions and procedures.	No later than four (4) months after effectiveness	PIU
Recruit an external auditor to conduct annual financial audit of the financial statements of the project along with the review of the internal control system.	No later than four (4) months after effectiveness	PIU
Prepare the Scholarship Manual	Disbursement condition under the related category	PIU
Provide the detailed reorganization plan for MEADEN	No later than six (6) months after effectiveness	MEADEN / PIU

Financial Management Arrangements

10. In line with the use of the country national system, the project's FM arrangements will rely on the existing country FM arrangements put in place to manage donor-funded projects. These arrangements are centered on two main institutions: (a) the CAA equipped with dedicated tools developed by the World Bank Institutional Development Fund (IDF); and (b) the Ministry of Public Procurement in charge of *ex ante* control of all supplier invoices associated with a contract before any payment by CAA.

11. **Staffing.** The PIU will be responsible for the day-to-day implementation of FM activities and will be staffed with a qualified FM team comprised of an FM officer and an accountant; a second accountant could be hired during implementation dedicated to e-vouchers, grants and scholarships' activities. The team will be supported by an internal auditor. The team will ensure the transmission of financial data, archiving of financial data, and additional controls to be implemented in order to ensure accuracy and completeness of the project financial data. This also includes ensuring that every transaction is duly authorized and properly recorded and that assets are safeguarded.

12. **Budgeting.** The overall responsibility for the preparation of an annual work plan (AWP) and the annual budget *(plan de travail et du budget annuel, PTBA)* will lie with the Project Coordination Unit (PIU). The different stages of budget preparation and management (preparation, review, adoption, and execution) are detailed in the FM section of the PIM. The annual work plan and budget will be prepared each year and submitted to a first level of approval by the PSC and then resubmitted to a second level of approval (Notice of Non-Objection) by the World Bank. Each PTBA approval process at all levels must be triggered within a reasonable time to facilitate their inclusion in the national finance law of the reference year. A budget execution report will be included in the documentation to allow monitoring of project implementation.

13. **Accounting Policies and Procedures.** The PIU's FM team will assume the overall responsibility for maintaining accounts associated with the project's activities and ensuring that annual financial statements

are produced in a timely manner, and in accordance with accounting standards that are in effect in Cameroon.[11] This will be ensured through the procurement and the use of an accounting software that will be parameterized accordingly. The software might be capable of keeping records of the project financial activities and generate financial statements that are in line with the project reporting requirements. The software might be able to also record procurement transactions and keep track of the project assets. The budget and accounting modules of the integrated FM system for donor-funded Projects (SIGED) is being used by the CAA and for the sake of consolidation and ease of data sharing, the project will procure, install, and use same system, namely TOMPRO developed by TOMATE. It is expected that the information system will be in place and customized to record the project's transactions and to produce periodic reports not later than two months after the effectiveness date.

14. Furthermore, the interface that will be developed between SIGED and existing systems within the Directorate of Public Treasury (PATRIOT) and the Directorate of Investment Projects (PROBMIS) will allow for the easy incorporation of the project's transactions into national financial statements. Processes and procedures governing sound project records will be detailed in the procedures' manual to ensure the sustainability of practices within the FM team.

15. **Internal Control and Internal Auditing**. Administrative, financial, and accounting procedures will be specified in the Procedures Manual (Administration, Finance, and Accounting). The manual will include a clear description of initiation and approval processes, and the designation of duties and responsibilities. The standardized FM Manual of Procedures developed by CAA with World Bank IDF support will be customized to reflect the specificities of the project. The PIU will make use of the computerized accounting system to capture all project-related transactions. FM officers will be responsible for maintaining all controls to ensure: (i) that the project funds are used only for the purposes they were intended in an efficient and economical way; (ii) the preparation of regular, accurate, reliable, and timely financial reports; and (iii) that the project's assets are adequately safeguarded. Those internal control arrangements are reinforced by the Government's internal control arrangements, such as the prior visa payments by the Ministry of Public Contracts that will apply to the project's invoices and CAA controls regarding withdrawal applications and payment requests.

16. Specific manuals will be prepared for e-vouchers, matching grants and scholarships mechanisms. They will detail processes for selecting the beneficiaries, for transferring funds, for justifying and verifying the effective use of funds allocated, for ensuring physical execution and control mechanisms, and for accounting for those transactions following the appropriate accounting principles.

17. To sustain the capacity building initiatives for the project team, the World Bank Finance and Loan Department and FM units will provide training to the Project FM team on disbursement and FM procedures. All of these measures will aim to further enhance the project's internal control system.

18. Taking into account the complex nature of the project, and to ensure the integrity of the internal control environment and associated systems throughout the life of the Project, an internal auditor will be recruited. The internal auditor will conduct *ex post* reviews of the project's transactions executed in support of the matching grants and the implementation of the related activities. In addition, the Internal Auditor will be required to conduct a periodic review of the continuing adequacy of the internal control environment in general and report on its state to project management and the steering committee. Internal audit reports will be produced quarterly, or within a shorter period, depending on the risk matrix and its

[11] The accounting principles set out by L'Organisation pour l'Harmonisation en Afrique du Droit des Affaires–OHADA.

associated audit plan, both of which must be elaborated during the first month of the internal auditor's assignment.

19. **Financial Reporting and Monitoring**. Interim financial reports (IFRs) will be generated using the computerized FM system. They will be prepared and submitted to the World Bank within 45 days of the end of each calendar quarter. The content of the IFRs will typically include: (i) the sources and uses of funds by the classification of project expenditures (detailed by components and activities); (ii) a comparison of budgeted and actual project expenditure (commitment and disbursement) by date and for the quarter; (iii) a statement on the use of funds by component or activity; (iv) the DAs activity; and (v) a physical progress report on project implementation. At the end of each fiscal year, the project will prepare annual financial statements that will be subject to external audit.

20. **External Auditing**. The annual financial statements prepared by the PIU as well as the internal control system will be subject to an annual audit by a reputable and independent auditing firm based on TORs satisfactory to IDA. The scope of the audit will be tailored to the project's specific risks in accordance with World Bank requirements and will be agreed upon with the Government. In particular, the independent auditor will audit the use of all funds flowing from DAs to beneficiaries. The project will comply with the World Bank's access to information and disclosure policies by making all disclosable audit reports (opinion report only) promptly available to the public after receiving them. The project's external auditor will be hired within four months of project effectiveness. A single audit opinion, in compliance with International Standards on Auditing, will be issued and will cover all project receipts, payments, and accounts. The audited financial statements, along with the auditor's report and management letter (incorporating management's comments), covering any identified internal control and accounting system weaknesses, will be submitted to IDA within six months of the end of each financial year.

21. **Funds Flow and Disbursement Arrangements**. The flow of funds will rely on the Government's banking arrangements through CAA. In this regard, CAA's managing directors will continue to act as public accountants. This includes signing authorization for all means of payment, using the automated payments module of the CAA information system for donor financing.

22. A DA will be opened in a commercial bank acceptable to the World Bank and transactions accounts may be opened at the PIU level. As per the country system, the signatory of the DA is the General Manager of CAA. The transactions accounts would be replenished periodically by funds transferred from the DA A to finance eligible expenditures at the local level. A second DA B will be opened for the e-voucher mechanism in the amount of US$8.5 million to finance activities under Subcomponent 2.1 and for the matching grants mechanism in the amount of US$9.5 million to finance activities under Subcomponent 2.2.

23. IDA will make an initial advance disbursement into the DAs in Central African CFA (XAF) upon receiving a withdrawal application from the Project Implementing Unit. The initial advance would be equivalent to four (4) months' forecast of Eligible expenditures.

24. Replenishment of funds from IDA to the project's DAs will be made upon evidence of satisfactory utilization of the advance, reflected in statement of expenditures (SOEs) and/or on full documentation for payments above SOEs thresholds. Replenishment applications would be required to be submitted regularly on a monthly basis. Further details about disbursements to the project will be included in the disbursement procedures described in the Disbursement and Financial Information Letter (DFIL). If the DAs A and B remain inactive for more than six (6) months, the Borrower may be requested to refund to IDA amounts advanced to the DAs. IDA will have the right, as reflected in the Financing Agreement, to suspend disbursement of the Funds if reporting requirements are not complied with.

25. Specific arrangements for payments to beneficiaries of e-vouchers, matching grants, scholarships and to WUAs will be made in accordance with the procedures described in the specific manuals for the related activities.

Figure 1.1: Disbursement Channel

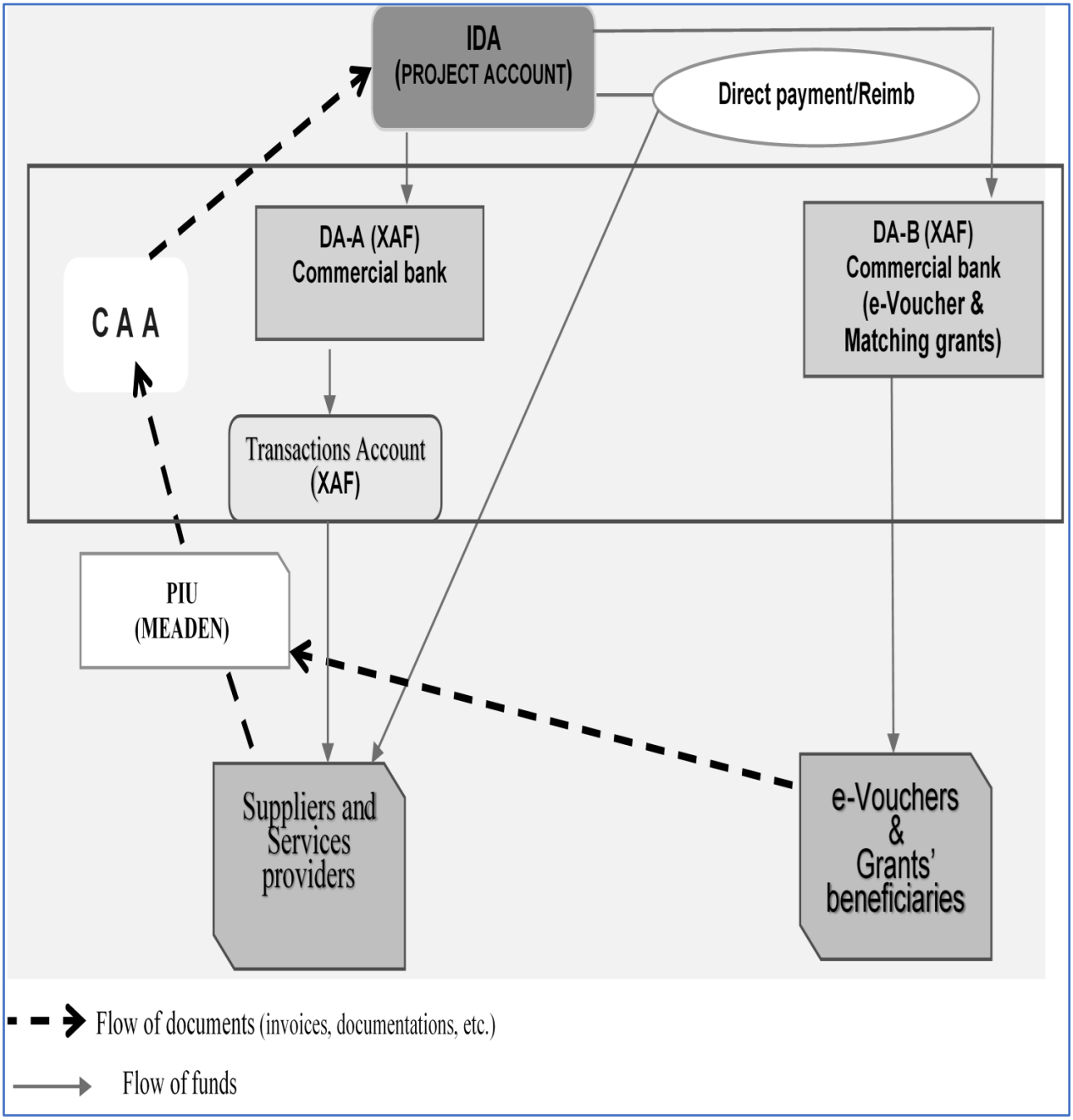


Table 1.3: Eligible Expenditures per Disbursing Categories

Category	Amount of the Credit Allocated (expressed in EUR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consulting services, Training and Operating Costs for Parts 1.1, 1.3, 2.2 (b), 2.3, 3.1, 3.2(a), 3.2(c), and 3.3 of the Project	37,038,750	100%
(2) Works for Part 1.2 of the Project	107,100,000	100%
(3) Goods, non-consulting services, and consulting services for Part 1.2 of the Project	13,387,500	100%
(4) e-Vouchers under Part 2.1 of the Project	7,586,250	100%
(5) Matching Grants under Part 2.2(a) of the Project	8,478,750	100%
(6) Scholarships under Part 3.2(b) of the Project	446,250	100%
(7) Emergency Expenditures under Part 4 of the Project	0	100%
(8) Refund of Preparation Advance	4,462,500	Amount payable pursuant to Section 2.07 (a) of the General Conditions
TOTAL AMOUNT	**178,500,000**	

26. **Conclusions of the FM Assessment.** The overall FM residual risk at preparation is considered High. The proposed FM arrangements for this project are considered adequate and meet the World Bank's minimum fiduciary requirements.

C. Procurement

27. **Guidelines**. Procurement for goods, works, non-consulting, and consulting services will be carried out in accordance with the procedures specified in the World Bank Procurement Regulations dated July 2016, revised November 2017 and August 2018 (Procurement Regulations), and provisions stipulated in the Financing Agreement.

28. **Fraud, coercion, and corruption**. The project's procurement activities will be carried out in accordance with the Anti-Corruption Guidelines (revised as of July 1, 2016).

29. **Procurement information and documentation - filing and database.** Procurement information will be recorded and reported as follows:

(i) Complete procurement documentation for each contract, including bidding documents, advertisements, bids received, bid evaluations, letters of acceptance, contract agreements, securities, and related correspondence will be maintained at the level of respective ministries in an orderly manner, readily available for audit.

(ii) Contract award information will be promptly recorded and contract rosters, as agreed, will be maintained.

(iii) Comprehensive quarterly reports indicating: (a) revised cost estimates, where applicable, for each contract; (b) status of ongoing procurement, including a comparison of originally planned and actual dates of the procurement actions, preparation of bidding documents, advertising, bidding, evaluation, contract award, and completion time for each contract; and (c) updated PPs, including revised dates, where applicable, for all procurement actions.

30. **Advertising Procedure**

- **General Procurement Notice, Specific Procurement Notices**, Requests for Expression of Interest, and results of the evaluation and contracts award should be published in accordance with advertising provisions in the Procurement Regulations.
- **For request for bids and request for proposals** that involve international bidders/consultants, the contract awards shall be published in the United Nations Development Business in line with the Provisions of the Procurement Regulations. For works and goods, the information to publish shall specify: (a) the name of each bidder who submitted a bid; (b) bid prices as read out at bid opening; (c) the name and evaluated prices of each bid that was evaluated; (d) the names of bidders whose bids were rejected and the reasons for their rejection; and (e) the name of the winning bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. For consultants, the following information must be published: (a) names of all consultants who submitted proposals; (b) technical points assigned to each consultant; (c) evaluated prices of each consultant; (d) final point ranking of the consultants; and (e) the name of the winning consultant and the price, duration, and summary scope of the contract. The same information will be sent to all consultants who submitted proposals.
- **For other contracts,** the information should be published in national/regional gazette periodically (at least, quarterly) and in the format of a summarized table covering the previous period with the following information: (a) the name of the bidder/consultant to whom the contract was awarded; (b) the price; (c) duration; and (d) scope of the contract.
- **Procurement for subprojects**: Procurement (works, goods, and services) for Component 2 will be conducted on the basis of community participation in accordance with clauses 6.38 and 6.57 of the World Bank Procurement Regulations (Particular types of Approved Selection Arrangements and particular types of Contractual Arrangements), and other procurement/selection methods detailed in the specific implementation manual for WUAs and matching-grants approved by the World Bank.

- **Training, workshops, and conferences**. The training (including training material and support), workshops, and conference attendance, will be carried out based on an approved annual training and workshop/conference plan. A detailed plan providing the nature of training/workshop, number of trainees/participants, duration, staff months, timing, and estimated cost will be submitted to IDA for review and approval before initiating the process. The appropriate methods of selection will be derived from the detailed schedule. After the training, the beneficiaries will be requested to submit a brief report indicating what skills have been acquired and how these skills will contribute to enhance his/her performance and contribute to the attainment of the PDO.
- **Operating costs.** Operating costs financed by the project are incremental expenses, including office supplies, vehicles operation and maintenance, maintenance of equipment, communication costs, supervision costs (that is, transport, accommodation, and per diem), and salaries of locally contracted staff. They will be procured using the procurement procedures specified in the project's manual of administrative, financial, and accounting procedures.

31. **Assessment of the PIU Capacities to Implement Procurement**

- The procurement activities for the project will be executed by the PIU reporting to MEADEN and MINEPAT. The PIU will carry out the following activities: (a) managing the overall procurement activities and ensuring compliance with the procurement process described in the relevant manuals; (b) ensuring compliance of bidding documents, draft Requests For Proposals, evaluation reports, and contracts with World Bank procedures; (c) preparing and updating of the PP; (d) monitoring the implementation of procurement activities; (e) developing procurement reports; and (f) seeking and obtaining approval of internal designated entities and then on IDA on procurement documents as required.
- An assessment of the capacity of the PIU to implement procurement activities of the project was carried out during project preparation. The assessment reviewed the organizational structure for implementation of the Project, the procurement capacity (past procurement experience, staff in charge of procurement, tools including manuals, procurement filing, etc.) of the MEADEN and the interaction between the different agencies/stakeholders involved in the project, as the project will implement an e-voucher and a matching grants mechanisms also.
- The assessment revealed that: (a) beneficiary agencies do not have sufficient technical expertise to prepare the technical documents (ToRs, bidding documents, technical specification), subject to the recruitment of consultants to reinforce specific activities; (b) that procurement capacity within the Ministry of Public Procurement *(Ministère des Marchés Publics, MINMAP)*, particularly with regard to IDA financing, is limited; and (c) MEADEN has no experience with World Bank procurement procedures and the Procurement Specialist who supported the project during preparation does not have sufficient capacity.
- The key risks identified for procurement under the Project are as follows: (a) technical staff not familiarized with complex works, which may lead to poor technical documents; (b) staff involved in the Project may not have sufficient knowledge of the NPF and/or there is a risk of confusion with previous sets of guidelines; (c) there is lack of proficient procurement staff to implement actions on time and in line with the NPF; (d) inadequate communication and interaction between the beneficiaries and the PIU may lead to delays in procurement processes and poor cost estimations; (e) administrative routines may increase delays in the procurement processes and affect Project implementation; and (f) the procurement in a specialized market with few bidders can restrict

competition and possibly increase prices and collusion risks; (g) the corruption risks in procurement of big contracts; and (h) poor filing which may lead to loss of documents. Overall, all these risks can cause mis-procurement, possible delays in evaluation of bids and technical proposals leading to implementation delays, poor quality of contract deliverables and reputational risks to the World Bank and the project.

32. **Contract management capability**. The major consultancy contracts are awarded by the PIU. The PIU being the implementing agency is overall responsible for the compliance to the agreed procurement procedures and processes and shall monitor the contractual performance including contract management issues, if any.

33. **The overall procurement risk** for the project is rated High. The residual risk will be Substantial after adopting the agreed mitigation action plan summarized in Table 1.4 below.

Table 1.4: Action Plan Mitigation Measures

Risk	Action	Responsibility	Date
1. Staff involved in the project who may not have sufficient knowledge on the NPF and/or risk of confusion with the former guidelines	Hire a Procurement Specialist based on ToRs acceptable to the World Bank Organize workshop sessions to train all staff involved in the procurement of the project on the NPF Continuous hands-on trainings of identified key staff on the NPF	PIU/PULCI World Bank Procurement Specialist PS/World Bank	Before end of the implementation of the PPA During the life of the project During the life of the project
2. Technical staff not familiarized with complex works, which may lead to poor technical documents	Hire on competitive basis qualified technical consultants to support drafting technical documents and participate in evaluation committees for complex projects	PIU/MEADEN	Four months after effectiveness
3. Inadequate communication and interaction between the beneficiaries and the PIU, which may lead to delays in procurement processes and poor estimation of the costs	Update the Project procedures manual of administrative, financial, accounting procedures to consider the NPF and clarify the role of each team member involved in the procurement	GoC/PIU/PULCI	Two months after effectiveness

Risk	Action	Responsibility	Date
	process of the project and the maximum delay for each procurement stage, specifically with regard to the review, approval system, and signature of contracts Prepare the E-voucher and Grants Manual	PIU/PULCI PIU/PULCI	Before any disbursement under category 4 and 5 respectively
4. Administrative routines may increase delays in the procurement processes and affect project implementation	Exercise quality control on all aspects of the procurement process, including developing ToRs, technical specifications, bidding documents, proposals, request for quotations, evaluation, and award	PIU/MEADEN	During the life of the project
	Monitor, on a regular basis, the PP implementation and set up a close follow-up in relations with beneficiaries and official bodies involved (Ministry of Public Contracts [*Ministère des Marchés Publics; CAA]* to ensure that appropriate actions are taken on time	PIU/MEADEN	During the life of the project
	Set up and operationalize a special tender board for the project in line with Cameroon procurement regulations to oversee reviewing procurement documents. The PULCI Special tender board will oversee reviewing such procurement documents up to the effectiveness of	PIU/MEADEN/MINEPAT/ MINMAP	Three months after effectiveness

Risk	Action	Responsibility	Date
	the Project. After the effectiveness the MEADEN Internal tender board will oversee reviewing such procurement documents up to the operationalization of the special tender board.		
5. Procurement in a specialized market with few bidders can restrict competition and possibly increase prices and collusion risks	All procurement of large contracts will be thoroughly reviewed by the World Bank. The project will benefit from HEIS.	PIU/MEADEN	During the life of the project
6. Corruption risks in procurement of large contracts	The Borrower will regularly update its market survey and cost estimates	PIU/MEADEN	During the life of the project
7. Poor filing, which can lead to loss of documents	Set an appropriate filing system at the level of PIU to ensure compliance with the World Bank procurement filing manual	PIU/Procurement Specialist	During the life of the project

34. **Frequency of procurement reviews and supervision:** The World Bank's prior and post reviews will be carried out based on thresholds indicated in Table 1.5. IDA will conduct six-monthly supervision missions and annual post-procurement reviews. The standard post-procurement reviews by World Bank staff should cover at least 20 percent of contracts subject to post-review. Post reviews consist of reviewing technical, financial, and procurement reports on project procurement actions by World Bank staff or consultants selected and hired by the World Bank. Project supervision missions shall include a World Bank procurement specialist or a specialized consultant. IDA may also conduct an independent procurement review at any time until two years after the closing date of the project.

35. **Procurement prior review**. The procurement risk is rated High. Table 1.5 summarizes the procurement prior reviews. These prior review thresholds can evolve according to the variation of procurement risk during the life of the project.

Table 1.5: Procurement Prior Review Thresholds (US$ millions)

Type of Procurement	Thresholds
Works	5
Goods, Information technology, and non-consulting services	1.5
Consulting firms	0.5
Individual consultants	0.2

36. **PPSD and PP**

a. The different approaches, the selection methods for pre-qualification, estimated costs, prior review requirements, and time frame are agreed between the recipient and the World Bank in the PP;

b. A PPSD and a derived PP for the first 18 months of program implementation were prepared during appraisal and the final versions were approved on May 26, 2020. During implementation, the PP will be updated as required—at least annually—to reflect the actual program implementation needs and improvements in institutional capacity; and

c. Preferred arrangements of major contracts. As per the PPSD, Table 1.6 summarizes the key high-risk, value and prior review contracts for the project.

Table 1.6: Summary of PPSD

#	Contract Description	Budget Estimate (US$ millions)/Risk rating	Procurement Method/Market approach	World Bank's Review Yes/No	Evaluation Method • Rated Criteria (VfM) • Lowest Evaluated Cost
Works					
1	Rehabilitation of 1,000 ha and development of 5,000 ha RB, including construction of a dyke (15 km) along the RB of the Benue and Development of 5,000 ha LB, including construction of a dyke along the LB of the Benue (15 km)	129,456,000/ High	RFB/ International, Open	Yes	Lowest Evaluated Cost
Consulting Services					
2	Monitoring and control of rehabilitation works of 1,000 ha and development of 5,000 ha on the RB by gravitation, and 5,000 ha on the LB by pressurized irrigation.	6,823,000/ High	QCBS/International, Open	Yes	Lowest Evaluated Cost

3	TA for 1.3 and 2.1	8,000,000/High	QCBS/International, Open	Yes	Lowest Evaluated Cost
4	Prepare and support matching grants	3,000,000/High	QCBS/International, Open	Yes	Lowest Evaluated Cost

*RFB: Request for Bidding
*QCBS: Quality Based Selection

37. **Special procurement commission.** The GoC will set up and operationalize three months after the effectiveness a special tender board for the project in line with Cameroon procurement regulations to oversee reviewing procurement documents. The PULCI Special tender board will oversee reviewing such procurement documents up to the effectiveness of the Project. After the effectiveness the MEADEN internal tender board will oversee reviewing such procurement documents up to the operationalization of the special tender board.

D. Environmental and Social Safeguards

38. E&S monitoring will be undertaken to check the effectiveness and relevance of the implementation of the proposed mitigation measures. This will include regular visits to project areas. Overall, MEADEN, the PIU, and WUAs will have the lead role in monitoring sub-projects to ensure that their various E&S obligations are met. The divisional committees (MINEPDED as lead) in charge of monitoring ESMP will also monitor the implementation of E&S mitigation measures. Suitable project monitoring indicators will be developed by the PIU based on the mitigation measures and the ESMPs or RAPs. At the end of each irrigation scheme construction/rehabilitation phase, E&S issues shall be part of an environmental performance rating for the completion of works sent to the World Bank by the PIU.

39. Based on the ESMF and ESIA (version February 2020) for the 11,000 hectares known irrigation schemes, the residual E&S impacts after the mitigation measures are acceptable.

40. Field based Senior Environmental and Social Safeguard Specialists will supervise and support the implementation of the project and contribute to building the capacity of the client, and WUAs. The Gender Specialist will supervise and support the implementation of prevention and mitigation measures from the GBV/SEAH Action Plan.

41. MEADEN does not have in place a functional E&S management unit, and it will rely on the PIU E&S staff to plan and manage environmental, social risks and impacts associated with this project. These safeguards experts will support all World Bank-funded subprojects.

42. The central, provincial, and divisional ESIA authorities have the capacity to review and monitor E&S aspects of the project. However, unlike central ESIA authorities, devolved ESIA authorities have inadequate logistical and financial capacities to effectively monitor the ESMF, ESIA, ESMP, RPF, and RAP requirements. In addition, they lack social scientists and occupational health experts in their teams. To bridge this gap and ensure a proper management of the E&S risks and impacts associated with this project, the costs associated with their operation (supervision and inspection missions) will be borne under Component 3.

43. The proposed institutional management of E&S safeguard aspects are summarized in Table 1.7 below:

Table 1.7: Responsibilities for Safeguards Implementation

Entity	Responsibility and Safeguards Capacity for ESMF/ESIA/ESMP/PMP/RPF and RAP Implementation
MEADEN/PIU	MEADEN is the lead government institution for implementation of the VIVA Benue Project. Responsibilities include: • Overall PIU for the Project • PIU hires an independent, third party consultant to carry out the detailed ESIA which is a disbursement condition for works of Subcomponent 1.2. • PIU shall be responsible for oversight role and the implementation of mitigation measures and general compliance of the project with any permits, licenses and Approval Conditions and related regulations and standards on environment • PIU shall include environmental, social, health and occupational safety requirements in the bidding documents and contracts. • Report on matters of resolving complaints and grievances comprising GBV cases regarding the project activities by stakeholders • Report on incidents/accidents within 24 hours of occurrence **Capacity:** MEADEN does not have in-house capacity in terms of qualified staff to implement the ESMF/RPF and ESIA/ESMP/RAPs. Under the PPA, it has recruited two safeguards specialists to support the preparation phase. Two safeguards experts (environmental specialist and social specialist) who have sufficient training and experience in E&S issues and can effectively coordinate and provide expert advice to contractors on how to effectively implement the required safeguards under this project will be in place during implementation. A Gender Specialist with experience in gender as well as GBV programing, including mitigation and response to SEAH, will be recruited to join the team. The safeguards specialists, including the gender specialist, will train and guide the Divisional committees in charge of monitoring ESMPs on management of E&S aspects, including issues of health/occupational safety, resettlement, GBV/SEAH, GRM, and vulnerable groups.
Rice farmers, WUAs and other beneficiaries	**Responsibility:** Work with PIU/CGER and the national TA team to (i) implement good practices for the protection of the environment, including water, energy, soil health, and biodiversity & pest ecology management, and include (ii) E&S requirements in BPs. **Capacity:** WUAs are to be set up and will designate environmental and health safety focal points whose responsibility is to animate WUAs on environmental and occupational health issues, and also GRM focal points responsible to animate WUAs on grievances and complaints' issues comprising those related to GBV cases. In addition, E&S specialists to be recruited will be required to support WUAs. Key personnel from the PIU will be required to attend training workshops on ESMF, PMP, ESIA/ESMPs, RPF, and RAPs implementation to be organized by MEADEN.
Ministry of Environment, including	**Responsibility:** Review and approve ESIAs and Project Briefs as well as monitoring project implementation in accordance with national environmental laws and the respective regulations.

devolved units	**Capacity:** The Ministry of Environment does not have adequate capacity to monitor this project through its department of ESIA and the department of ESMP. Divisional committees in charge of monitoring ESMPs exist, but they lack technical and financial resources. The costs associated with the operation of these committees will be borne by the project under Component 4. Although MINEPDED has no social scientists and occupational safety expert, Divisional committees will include social experts, the labor department, and officials from the social affairs department and the women and family department.
Contractors including Contracting in Employment-intensive Works	**Responsibility:** Actual implementation of the project on the ground including installations. The Contractor will be responsible for planning, implementing, and reporting on mitigation measures during the execution of works. **Capacity:** The Contractors are unknown at this point. However, the selection criteria will include past E&S performance as well as adequacy of contractor's staff to effectively put mitigations in place. Contractors shall be required to develop Contractor's ESMP as part of the Bidding process. All contractors will be required to appoint seasoned safeguards staff for the implementation of their ESMPs. In addition, all sub-contractors will also be required to appoint seasoned safeguards staff for the implementation of their ESMPs.
Supervision engineer	**Responsibility:** The Supervision Engineer will ensure that execution of works by all contractors comply with established cost, quality, delivery deadlines, as well as compliance with environmental, social, and occupational safety requirements. **Capacity:** Supervision engineers will retain one EHS specialist/engineer at least throughout the project construction phase, one Environmental and Safety Engineer, one EHS inspector to monitor contractors' EHS performance, and one Social Specialist to monitor Social, including GRM and gender performance.
World Bank	The World Bank will be responsible for review and clearance of ESIAs/RAPs as well as offering implementation support supervision to the project's E&S performance through missions. The World Bank will also be responsible for reviewing regular monitoring reports and officially disclosing the ESIAs/RAPs on its website. Technical guidance may also be provided by the World Bank to the PIU as needed from time to time.

Implementation Support Plan

Strategy and **Approach for Implementation Support**

44. The key elements of the implementation support strategy include the following:

(a) **Timely support.** The World Bank implementation support will begin immediately after project approval to help the client achieve effectiveness on time. Two standard missions per year would be undertaken. The first Implementation Support Mission (ISM) would be undertaken at the latest three months after effectiveness of the project. Presence of the Co-TTL and part of the team in the Cameroon Country Office will allow close monitoring especially during the first year of implementation and whenever implementation challenges require a quick response.

(b) **Continuously strengthening capacities.** When needed, capacity building will be provided to the technical team. In addition, trainings will be provided by the task team on World Bank operations,

fiduciary, and safeguard aspects of the project to staff in the PIU. Moreover, on top of carrying out their usual implementation support functions, World Bank fiduciary, safeguard, and M&E specialists will be available to provide close support and detailed hands-on guidance to their counterparts during the initial months following effectiveness.

(c) **Technical support.** The World Bank task team will include technical specialists with expertise in a range of areas, drawn from within the institution and development partners (DPs) such as the FAO. Technical specialists unavailable in the World Bank Group and FAO/World Bank Cooperative Program (FAO/CP) pool would be recruited externally to support the implementation of the project. Members of the project's task team would organize and undertake field visits to verify compliance with the policies and procedures spelled out in the Financing Agreement, the PIM and other manuals, identify bottlenecks affecting implementation progress, and provide advice and recommendations to overcome the identified implementation challenges.

(d) **Fiduciary aspects.** The World Bank Fiduciary and Procurement Specialists will provide FM and hands-on procurement management support to the PIU. On the procurement side, the provision of additional support HEIS for quality and faster procurement has been requested by the client through the PPSD which was approved on May 26, 2020. On FM aspects, FM implementation support will use a risk-based approach and will involve a collaborative approach with the entire World Bank Task Team.

(e) **Safeguard compliance.** The task team will also have safeguard experts to help in capacity building and technical review of demanding safeguard cases. The Safeguards Specialists' role will be to monitor progress of the different E&S management systems, build up a database, develop indicators, ensure that the stakeholders are properly briefed and coordinating among themselves and provide expert advice as and when required.

(f) **Monitoring, evaluation, and knowledge management.** The task team will help the PIU in setting up and maintaining the project's decentralized M&E system. The system will be designed to facilitate systematic collection of the required data, which are needed to track progress in meeting the PDO, generate financial information, and document compliance with safeguards policies. Information generated by the M&E system, complemented by information emerging at the time of the MTR, will be used to adjust operational procedures and make the required mid-course corrections to the project implementation modalities, if deemed necessary.

45. The project's implementation will be supported by the task team members based in the World Bank office in Yaoundé and in Washington DC. Staff from other offices and consultants will provide additional support as needed.

Implementation Support Plan and Resource Requirements

46. In general, the task team will conduct two annual implementation support missions and field visits to the project area; however, during the first two years at least three missions will be undertaken annually. The Government will be required to prepare and share the formal documents for the mission's consideration at least two weeks before the mission takes place.

47. The World Bank's Procurement, FM, and Safeguards (both social and environment) are based in country, and will provide regular, timely implementation support, and TA to the counterpart teams during project implementation. These team members will also identify capacity building needs to strengthen the procurement, FM, and safeguard capacity of the client.

- **Procurement.** In addition to carrying out an annual post review of procurement that falls below the prior review thresholds, the Procurement Specialist will provide focused procurement support including: (a) reviewing procurement documents and providing timely feedback to the counterparts; (b) providing detailed advice and guidance on the application of the World Bank's Procurement Guidelines; and (c) monitoring procurement progress against the PP. The World Bank will also lend additional support through HEIS, as provided under the NPF.
- **Financial Management.** An initial implementation support mission will be undertaken three months following project effectiveness. Thereafter, implementation support missions will be scheduled, using the risk-based approach model, and will include the following activities: (i) monitoring of FM arrangements during the supervision process at intervals determined by the risk rating assigned to the overall FM Assessment at entry, and subsequently during implementation (included in the implementation status and results report - ISR); (ii) integrated fiduciary review of key contracts, (iii) review of the IFRs; (iv) review of the audit reports and management letters from the external auditors and follow-up on material accountability issues by engaging with the task team leader, client, and/or auditors; the quality of the audit (internal and external) will also be monitored closely to ensure that it covers all relevant aspects and to ensure confidence with regard to the appropriate use of funds by recipients; (v) on the ground supervision; and (vi) assistance to build or maintain appropriate FM capacity and efficient systems of internal control.

48. Tables 1.8 and 1.9 indicate the level of inputs that will be needed from the World Bank to provide appropriate and adequate implementation support for the proposed project during implementation.

Table 1.8: Implementation Support Plan

Time Year	Focus	Primary Skills Needed	Number of Missions	Estimated Budget (US$)
Year 1	• Project launch • Initialization of project components • FM systems functioning effectively • Procurement practices following World Bank norms • ESMF in place	• Team lead • FM, procurement • Environmental Specialist • Social Safeguards Specialist • Financial Sector Specialist • Irrigation Specialist • Value Chain/BP Specialist • Agricultural Economist • Gender Specialist • M&E Specialist • Communications Specialist • HEIS (5 missions)	2	200,000
Year 2	• Monitor implementation of project activities • FM, procurement, safeguards	• Team lead • FM, procurement • Environmental Specialist • Social Safeguards Specialist	2	200,000

Time Year	Focus	Primary Skills Needed	Number of Missions	Estimated Budget (US$)
		• Financial Sector/Business Specialist • Irrigation Specialist • Value Chain /BP Specialist • Agricultural Economist • On-Farm Water Management & Farm Mechanization Specialist • Gender Specialist • M&E Specialist • HEIS (5 missions)		
Year 3	• Monitor implementation of project activities • FM, procurement, safeguards • Midterm review	• Team lead • FM, procurement • Environmental Specialist • Social Safeguards Specialist • Financial Sector Specialist • Irrigation Specialist • Value Chain/BP Specialist • Agricultural Economist • On-Farm Water Management & Farm Mechanization Specialist • Gender Specialist • M&E Specialist/communications	2	180,000
Year 4	• Monitor implementation of project activities • FM, procurement, safeguards	• Team lead • FM, procurement • Environmental Specialist • Financial Sector Specialist • Social Safeguards Specialist • Irrigation Specialist • Value Chain/BP Specialist • On-Farm Water Management & Farm Mechanization Specialist • Gender Specialist • M&E Specialist/communications	2	180,000
Year 5	• Monitor implementation of project activities • FM, procurement, safeguards	• Team lead • FM, procurement • Environment Specialist • Social Safeguards Specialist	2	180,000

Time Year	Focus	Primary Skills Needed	Number of Missions	Estimated Budget (US$)
		• Financial Sector Specialist • Irrigation Specialist • Value Chain/BP Specialist • Agricultural Economist • On-Farm Water Management & Farm Mechanization Specialist • Gender Specialist • M&E Specialist/Communication		
Year 6	• Monitor implementation of project activities • FM, procurement, safeguards	• Team lead • FM, procurement • Environment Specialist • Social Safeguards Specialist • Financial Sector Specialist • Irrigation Specialist • Value Chain/BP Specialist • Agricultural Economist • On-Farm Water Management & Farm Mechanization Specialist • Gender Specialist • M&E Specialist/Communication	2	180,000
Year 7	• Project withdrawal and closure • Implementation Completion and Results Report (ICR)	• Team lead • FM, procurement • Environmental Specialist • Financial Sector Specialist • Social Safeguards Specialist • Irrigation Specialist • Value Chain/BP Specialist • Agricultural Economist • On-Farm Water Management & Farm Mechanization Specialist • Gender Specialist • M&E Specialist • Communications Specialist • ICR writer	2	180,000

Table 1.9: Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips Per year	Comments
Task Team Leader	20	2	Cameroon country office-based
Co-Task Team Leader	10	2	Region/HQs
FM Specialist	6	NA	Cameroon country office-based
Procurement Specialist	6	NA	Cameroon country office-based
Environmental Safeguards Specialist	6	NA	Cameroon country office-based
Social Safeguard Specialist	6	NA	Cameroon country office-based
Irrigation Specialist	7	2	FAO/CP
M&E Specialist	7	2	TBD
Private Sector Specialist	7	2	TBD
Agriculture Specialist	7	2	Region/HQs or FAO CP
On-Farm Water Management & Farm Mechanization Specialist	7	2	FAO/CP
Gender Specialist	7	2	Region/HQs
Communication Officer	7	2	Cameroon country office-based
Operation Analyst	7	2	Cameroon country office-based
Program Assistant	10	2	Cameroon country office-based

ANNEX 2: Detailed Project Description

1. The construction of the Lagdo dam some forty years ago created an artificial lake of 75,998 ha of surface area with 733 km of cumulative bank length (see Figure 2.1). Since then, the lake has become a new source of livelihood that encouraged resettlement on both sides of the river. Activities include fishing, fish-smoking, agriculture, logging, and exploitation of non-timber forest products. Most of the LB, however, is classified as protected areas under a number of hunting areas *(zones d'intérêt cynégétique,* ZICs) and is part of the buffer zone to the Benue National Park, while the ZICs upstream of the city of Rey Bouba are part of the buffer zone to the Bouba-Ndjida National Park. While settlement in ZICs is officially prohibited, pressure on the land fueled by internal migration has resulted in an increasing population. Cultivated areas in the ZICs and in the municipality of Lago and Rey Bouba continue to expand, and thousands of families are now settled around the lake. The increase in agricultural area is also partly the result of lower catches in the lake due to its progressive eutrophication. The cumulative effects of deforestation and unsustainable farming practices contribute to soil erosion and therefore silting of the lake, decreasing the reservoir capacity.

2. The municipality of Lagdo has undertaken actions to restore the vegetation cover with the support of several partners. On the LB approximately 1,000 ha were reforested with support of PNDP (*Programme National de Développement Participatif* - P144637) and MEADEN, and on the RB, within the new communal forest, the EU and a private partner (African Commodities) supported the technical center of the municipal forest to recover 1,000 ha in 3 years. These efforts need to be scaled up all around the lake to significantly limit erosion and restore vegetation. Realistically, they will need to combine fruit and forest/timber production, forage production, vegetable and staple crops under a climate-smart approach. Cotton cultivation would need to be reduced to the benefit of cashew, and reforestation and afforestation would need to be considered a priority in consideration of the practice of smoking fish from the lake.

Component 1: Improvement of Infrastructures and Water Management (US$166.9 million of which US$153.0 million equivalent from IDA and US$13.9 million equivalent from beneficiaries)

3. **Subcomponent 1.1: Security and Operation of Main Hydraulic Infrastructure** (US$9.0 million from IDA). The Lagdo Reservoir impounded behind the Lagdo Dam provides water for power generation and irrigation of lands located immediately below the dam on both banks of the river, and it is designed to provide flood modulation as well. The lake is also a resource for fisheries. The total water resources are in the order of 5,900 million m^3 of which 400 million m^3 are allocated for irrigation and based on the studies the annual water demand for the 11,000 ha will be of 205 million m3 per year (51 percent below the original amount attributed and only 3 percent of the entire reservoir). A Water Management Committee of Lagdo dam *(Comité de Gestion de l'Eau du Barrage de Lagdo)* was created in 2015 but it has never been operationalized. This is particularly important, given the multi-purpose nature of the dam. This Committee has allocation capabilities for every large user (RBIS-Lagdo, LBIS-Lagdo, ENEO, water supply, and others) at the end of every rainy season based on the water level of the reservoir. In addition, there is a Coordination Committee between Cameroon and Nigeria for integrated water resources management and that is led by MEADEN. The improvement of information about the river basin will improve the decision-making process of this Coordination Committee. These activities are required to ensure that the Lagdo Dam is viable as a water storage solution for building resilience to climate change-induced droughts and to protect the local population from climate-induced flooding.

4. Based on the existing studies, particularly the dam safety assessment report done during preparation, and a comprehensive hydraulic and hydrological study of the entire basin to be done during implementation, six main activities are envisaged under this subcomponent:

(a) **Activity 1: Establish a Water Resources Monitoring Network and Information System**. Presently there is basically only one operational hydro-meteorological station in the entire river basin (at the dam site) operational. The hydrometeorological network would be increased to a minimum of six stations in the various sub-basins (Benue and Kebbi and Faro rivers) in order to properly monitor water resources in the basin and to optimize the operation rules of the Lagdo reservoir. This would include at least one station upstream of Lagdo dam for early warning and improving the dam's safety and operation, as well as others in the Kebbi sub-basin for properly understanding the cause of the floods and elaborating accurate flood early warning systems and decision making. With regard to this activity, it is understood that the transformed MEADEN will have a specialized unit for monitoring data, which will have to work in close coordination with the Hydrological Research Center and the National Meteorological Department. For the implementation of the project, an agreement will be established (convention or administrative act) between MEADEN and those two institutions.

(b) **Activity 2: Ensure long-term dam operation and safety of Lagdo dam**. The dam is owned by the GoC, with ENEO operating under an umbrella contract for energy generation and distribution throughout the country. Currently, the dam is being inspected periodically by a national expert panel from ENEO. Funds would be provided to set up an independent dam safety panel (consisting of a hydrology and hydraulics specialist, a dam monitoring specialist, and a hydromechanical equipment specialist) with specific ToR in accordance with Dam Safety Guidelines of the World Bank (OP 4.37). A dam safety review was carried out by an independent specialist in 2019. The outcome of this review confirms the general good condition and performance of the dam and its appurtenant structures. The dam is well operated and maintained, and the installed monitoring equipment allows a satisfactory surveillance of the behavior of the dam structure. Nevertheless, a key risk issue for the project are releases of water beyond 1,800 m^3 per second, which would not only jeopardize many people's live but destroy some of the project's infrastructure. Assurances will be needed from government/ENEO to restrict water releases, when necessary toward the end of the rainy season, to strictly less than 1,800 m3 per second. The recommendations of the dam specialist to ensure an acceptable dam safety risk include (i) improve water management; (ii) review and update of the hydrology with a consequence of a possible requirement for increasing the discharge capacity of the dam; (iii) rehabilitation of the spillway gates hoisting system; (iv) rehabilitation and upgrade of the dam monitoring equipment, including capacity building and training of the staff in charge of the O&M of the dam; (v) inspection and repair, if justified, for operation or safety reasons, of both penstocks and bottom outlet tunnel; (vi) implementation of other minor maintenance works to ensure long-term safe operation; and (vii) review and update of dam safety plans (O&M Plan, Instrumentation Plan, and EPP) according to GIIP and taking into account recent technological developments. The dam was built in the early 1980s and the international design standards for both the hydraulic and structural design of the dam have changed substantially during the last four decades. The hydrologic computations for the dam/reservoir complex would be revisited, and if required, the design floods would be revised on the basis of today's standards. Hydraulic computations would also be revised to ensure that flood handling mechanisms are adequate to meet current standards, in particular to avoid/limit inundation of areas downstream of the dam. The structural

safety of the dam, under static loads only, will be reviewed according to current design criteria; the region is not prone to earthquakes. Both the surveillance and monitoring program as well as the operation and maintenance plan will be revisited and updated/upgraded according to GIIP. Funds would be provided to carry out the required studies and analysis using reputed firms. Funds would be provided to make any structural modifications required to the dam and spillway arising out of these studies. This would include the revamping of the Water Management Committee of Lagdo dam *(Comité de Gestion de l'Eau du Barrage de Lagdo)* created in 2015 but with no operations up to now. Improved EPPs would also be prepared using up-to-date maps and technology as well as a flooding early warning system developed.

(c) **Activity 3: Putting in place an expert panel for dam safety and water management.** It is imperative to protect investments downstream from the Lagdo dam from the risks incurred by releases greater than 1,800 m^3/s. The Government informed the World Bank that a new water regulation and management of structuring dams was recently adopted by the NBA. The project will take into account these regulations to improve the management model of the Lagdo dam. Given the delay in implementing the new management arrangements for the dam, guarantees for the implementation of alternative arrangements are necessary before the start of investments in the field with a clear definition of the responsibilities of the various stakeholders (MINEE, MEADEN, ENEO, etc.);

(d) **Activity 4: Establishment of a joint flood forecasting model in the Benue and Mayo Krebbi river sub-basins and improving the management of the dam and its water releases** (limit releases to less than 1,800 m^3 per second to protect planned investments and people downstream) and also improving decision support systems within the Benue Basin all the way until the Nigeria border (250 km). Presently there is a simple flood alert system for 17 km that would be expanded in distance (to 250 km) and capabilities;

(e) **Activity 5: Putting in place an alert system from Lagdo down to the border with Nigeria;** and

(f) **Activity 6: Regional coordination with the NBA.** The development of the Benue Sub-basin strategic plan would be closely aligned to the priorities defined by the NBA that coordinates local activities between the member states. This activity includes the collation of existing information using modern GIS, remote sensing, and other spatial datasets and tools. These activities are required to ensure that the Lagdo Dam is viable as a water storage solution for building resilience to climate change-induced droughts and to protect the local population from climate-induced flooding. This would help in the decision-making process of the Coordination Committee between Cameroon and Nigeria for integrated water resources management that is led from the Cameroon side by MINEPAT.

5. Information on monitoring data from the local environment related to climate shocks will be included as part of the structure of the training, capacity building, and implementation activities. As a result of the above six activities, the capacity in the project area to track climate-related data and respond in real time to climate-induced risks, like flooding and drought, would be increased through the project, especially with regard to the high level of evaporation and the fact that rainfall levels switch from high and low extremes throughout the calendar year.

6. **Subcomponent 1.2: Irrigation and Drainage Infrastructure** (US$148.9 million of which US$135.0 million equivalent from IDA and US$13.9 million equivalent from beneficiaries). Provision was made in the original design of the Lagdo Dam Complex to provide irrigation water (400 million m^3) to

irrigate lands situated on both banks of the river immediately downstream. Original designs allowed for gravity irrigation of about 6,000 ha on the RB and about 5,000 ha on the LB. However, only limited irrigation infrastructure was built along the RB, covering about 1,000 ha, of which only about 600 ha can presently be irrigated. No infrastructure, including a water intake, was built on the LB. Studies to update detailed design and bidding documents are ongoing during preparation for the equipment of roughly 10,000 ha of irrigation schemes with an annual water demand of 205 million m^3 per year (51 percent below the original amount attributed and only about 5 percent of the existing reservoir capacity). The entire irrigation schemes are expected to use zero-emissions gravity-based systems. The irrigation scheme will improve farmers' resilience to droughts exacerbated by climate change, while also promoting efficient water usage.

7. Left LBIS: There is potential to develop a gravity-fed, pressurized irrigation scheme of about 5,120 ha directly from the reservoir, under the premise that this will not be used for rice cultivation during the DS. About 3,625 ha would be for agro-industrial farms and about 1,500 ha for small farmers (about 3,000 households). The project will finance all irrigation infrastructure for 30-ha blocks. In the areas for smallholders, the project will finance directly all the on-farm development down to 1-ha units. In the areas for the agro-industrial farms, the latter will finance by themselves the on-farm development; they will be able to access the matching grants of Subcomponent 2.2 for that purpose. The minimum water level at Lagdo Dam will ensure a pressure of 1.27 bar at every outlet between the months of November and February when the irrigation water needs are the highest. Annual water demand would be 55 million m^3. Preliminary designs provide for a buried pipe network that could be developed on a modular basis to allow flexible private sector development. Preliminary estimates based on 30 ha blocks, each with its own metered connection, indicate a cost of around US$51 million (US$10,000 per ha), with the on-farm development of individual blocks being left to the private sector. These have been estimated at US$3,800 /ha with a full cover of micro sprinklers and drip irrigation. The outlets for villages' small farms are designed for surface irrigation. A meter with prepayment at the farm gate of 30 ha will allow the control of water supply to the villages. For small farms gate of 30 ha, a piped distribution network with a simple alfalfa valve of 13 l/s discharge will supply each 1.0 ha of land. The cost for the protection dyke on the LB amounts to about US$6.8 million.

8. RBIS: There is an opportunity to rehabilitate and expand the existing operational 600 ha into an irrigation scheme of about 5,320 ha for about 5,300 existing households and for another 5,300 additional households. The on-going studies have developed cropping patterns on the basis of soil suitability, climate factors, and adaptability. Approximately 60 percent of the area is suitable for rice (that is being promoted by the Government) and 40 percent of the area for a mix of maize and horticultural crops. Annual water demand is 150 million m^3. Preliminary designs show two options: (i) a simple rehabilitation and expansion of the existing irrigation, and (ii) an improved rehabilitation, changing from upstream water control to downstream water control for primary canal level in order to facilitate also the transition into WUAs. Costs are in the order of US$55 million for these RB investments (US$5 million rehabilitation and US$50 million new development). The cost for the protection dyke on the RB amounts to about US$5.3 million.

9. The I&D infrastructure would be transferred gradually to the WUAs. For this purpose, arrangements, such as performance contracts and training, could be put in place. In this Subcomponent, the project will adopt a socio-technical modernization approach in conjunction with Subcomponent 1.3. This would require the establishment of suitably sized, financially viable, and autonomous (technical) hydraulic units for the self-governing WUAs to be established under Subcomponent 1.3. Hydraulic

structures would also be needed to enable practical and enforceable distribution modalities within the boundary of the WUA area of operation. Legal arrangements on land allocation and management will be updated as well in compliance with the legal framework in Cameroon and international good practices implemented in public irrigation schemes in similar contexts.

10. On the basis of the next studies and, in particular those of component 1.3 which should define the criteria for the allocation of plots, it will be necessary to take the results into account to propose an adapted model. Consideration could be given to reviewing the size of the plots allocated to smallholders based on their economic performance and also to note that the areas allocated to agro-industries will themselves require a lot of labor. Furthermore, it is important that technical studies are well coordinated with social and environmental studies, and with RAP (for example concerning dikes and trees).

11. The activities associated with the ESMP of this subcomponent, such as reforestation of the river banks, will be financed as services by the project.

12. **Subcomponent 1.3: Irrigation Management and Drainage** (US$9.0 million from IDA). This Subcomponent will address the daunting challenge of ensuring the long-term viability of the I&D services delivered to the irrigation schemes. The first step will be the issuance of a Ministerial Decision from MINADER approving the management rules for irrigation schemes in the Adamawa, North and Far-North regions. Based on this, a scheme management code for each scheme (RB and LB) will be elaborated that will include : (i) land tenure arrangements; (ii) WUA rights and duties; (iii) WUA legal/financial oversight; (iv) rehabilitation/construction, training and transfer agreements; (v) rights and duties of the parties and (vi) dispute resolution mechanism. This subcomponent will include (i) a comprehensive technical and management training program for the WUAs; (ii) a comprehensive technical and management training program for the MEADEN oversight unit (in collaboration with Subcomponent 3.1); (iii) equipment and facilities (meeting rooms, computers, small equipment for canal operation and maintenance, etc.) for the WUAs; (iv) the elaboration of clear and concise technical specifications for the transfer of secondary and main canals; (v) the regulations for the transfer of irrigation management to the WUAs ensuring a compulsory membership; and (vi) the elaboration of regulations for the management of the irrigation schemes. The approach will be implemented with a TA while MEADEN remains with an oversight role. In addition, the TA will also work at national level for supporting the preparation of a legal framework for irrigation management by the WUAs in the revised Water Code or a separate irrigation law.

13. This subcomponent will also support the process of allocating plots and includes specific activities for smallholders and for large landholders. The proposed approach is as follows: (i) definition of criteria for the allocation of plots; (ii) constitution of WUAs (based on secondary canals); (iii) development of the allocation contract including the specifications for land-use contracts; (iv) Implementation of the scheme management code to provide the regulations for the transfer of irrigation management to the WUAs ensuring a compulsory membership; (v) updating the database of beneficiaries and developing the GIS cartography; (vi) issuance and signature of contracts and allocation of plots; and (vii) training and support for WUAs for two years. For the operationalization of this approach the TA will ensure awareness and communication; identification and optimum localization of plots for each beneficiary; and Management of the subsidy mechanism for the revival of agricultural production by purchase vouchers (part of Subcomponent 2.1). For the validation of the criteria for the allocation of plots for smallholders and for the agro-industry and the content of the allocation contract including the specifications, the non-objection of the World Bank will be required. Similarly, for the scheme management code where the regulations of the irrigation management transfer will be specified the World Bank no objection will be required. An inter-ministerial commission will be set up for the

allocation of plots in RD and RG. Additionally, the TA will also work at national level for supporting the preparation of a legal framework for irrigation management by the WUAs in the revised Water Code or a separate irrigation law.

14. For the RBIS, the approach will be first piloted in the rehabilitation area (1,000 ha). The investments under this Subcomponent will support the development of a detailed training program within the Technical Innovation Center (TIC) following a Farmer Field School approach. Subsequently, other WUAs will be established following the completion of construction, the settlement of farmers, based on the land allocation criteria, and the provision of training, on a sequential basis. In the longer term, it is envisaged that a WUA federation will be established to take over responsibility from MEADEN for the management, operation, and maintenance of the primary canal. An extensive training program will be implemented for practical irrigation management and irrigation scheduling on-farm. The existing water fee will be split into: (i) a water fee to be managed by the WUAs, and (ii) a land preparation fee that will be managed independently. A WUA oversight unit will be established at MEADEN. The subcomponent may also include establishing and supervising performance contracts, as well as minor equipment support for the WUAs.

15. For the LB irrigation scheme, the sequence of development and management of the 3,625 ha for agro-industrial development would be:

a. the main network will be planned for the whole scheme developed by the Government in five stages;

b. the land will be allotted to private farmers or entities through an expression of interest based on criteria developed by the project;

c. the on-farm development will be carried out by the farmers or entities, including with the project support (matching grants of Component 2); and

d. once sufficient land is developed, the WUA of the LB will be formed for taking over the overall management of the LB system.

16. The land allotment criteria will include social inclusion, capabilities to carry out the farm's operations, and cost-sharing arrangements (the details will be developed by the project in consultation with the World Bank and in agreement with sustainable practices in I&D and agriculture practices). A roadshow with the clear land allotment criteria will be elaborated to seek private sector participation in parallel to the development of the main scheme for ensuring wider participation from private farmers and entities. The main system consisting of 3,625 ha will be developed in two blocks. Each block will be allotted to the private farmers and entities in a sequential manner. The pressurized system allows this modular approach and reduces the main risks generally associated with irrigation (e.g. stealing of water, excessive losses, disparity between tail and head, etc.), thus maintaining equity in distribution. This system will also ensure water for irrigation purposes is used efficiently, thus building resilience against climate change-induced droughts.

17. For the 1,319 ha on the LB to be allocated to the small farmers from the current villages, the approach is similar to the RB. On the LB, there is a specific situation for 177 ha[12] which are outside the irrigation perimeter, this area was not part of the expropriation process, led in 2000. This area is part of

[12] These 177 ha are not part of the 6342 ha targeted in Decree 2010/3444/PM of December 15, 2010, incorporating into the Private State Domain a dependency of the National Domain located on the LB.

the national domain (and not State land), smallholders will stay in the area. They will not be in the irrigation scheme; however, water from the irrigation structure will be available against a fee payment.

18. This subcomponent will ensure that the new I&D institutional arrangements are based on two fundamental principles: (i) the transfer of responsibility to WUAs so as to be administratively, technically, and financially viable; and (ii) explicit and legally-binding service-delivery agreements would be put in place with specified service parameters (e.g. flow, duration, timeliness, etc.). WUAs would be responsible for water distribution and allocation within each of their defined and agreed areas of operation (boundary/perimeter), and for fee collection and enforcement of water rules. The role of women farmers and their representation in WUAs would be given specific attention, both through awareness raising on women rights and their contributions to development of the local economy as well as by specific WUA constitutional provisions; in addition, training of farmers will include sessions targeting women in technical aspects where they may have been excluded previously. This will contribute to shifting of perspectives among men of the value, capability, and importance of women being involved in WUA technical, administrative, and leadership functions. The Gender Specialist of the PIU will ensure that regular consultations are held with women farmers and women organizations, during the project life, to hear their voices, opinions, and concerns related to their satisfaction of the project activities and grievance redress system accessibility and quality. Information gathered will be used to adjust the services provided to women by the GBV service providers, ESMF, etc.

Component 2: Agriculture Production and Support Services (US$61.1 million of which US$21.0 million equivalent from IDA and US$40.1 million equivalent from beneficiaries)

19. **Subcomponent 2.1: E-vouchers for Launching Production in the Irrigation Perimeters** (US$15.3 million of which US$8.5 million equivalent from IDA and US$6.8 million equivalent from beneficiaries). This subcomponent will support the capacity of farmers to purchase agricultural inputs, pay for the water fee, pay for (mechanized) labor, and do PLL; all in a regressive manner with support to be phased out after one, two, or three years, depending on the type of inputs (see Table 2.1). For each beneficiary a subsidy of the order of US$350 will be provided during the first year, US$200 during the second year, and US$75 for the third year (see Table 2.1), assuming that, under the project, farmers will be able to increase production from one to two crops per year, with private sector support.

20. A total of 40,920 vouchers will be provided (see Table 2.2) with a total value of about US$8.5 million. Given the large number of farmers/vouchers, PIU will be accompanied by a TA to implement this subcomponent, under the overall supervision of an agricultural economist in the PIU.

21. **E-voucher mechanism**. Electronic purchase orders will be based on the e-voucher Manual of the project, that will follow the guidelines of the recently completed MINADER Manual of Agricultural Input Subsidy Procedures adopted by PM Decree on August 28, 2019. The delivery of subsidized fertilizer to beneficiaries will be carried out by local private agents against vouchers that can be easily managed through mobile phones (e-vouchers), to which most farmers have access. Suppliers will receive a bank transfer of the difference between the actual price of the market and the subsidized price. Agreements are signed with commercial banks and microfinance institutions active in Lagdo and in the Benue Valley and with the main suppliers of fertilizers represented locally. This scheme will exclusively subsidize inputs across selected value chains in the Benue Valley. The amount of the subsidy is fixed annually with an equitable distribution between the newly developed areas in Lagdo and the downstream lowland areas. For PLL and land preparation, vouchers will be against newly developed plots and in decreasing amounts over the first 6-8 production seasons (3-4 years). Besides providing an important service to

farmers, the implementation of the scheme will promote professional agricultural service provision (which could also be eligible for financing by the project on the basis of BPs, see Subcomponent 2.2 below).

Figure 2.2: Existing and Redefined Roles of MEADEN

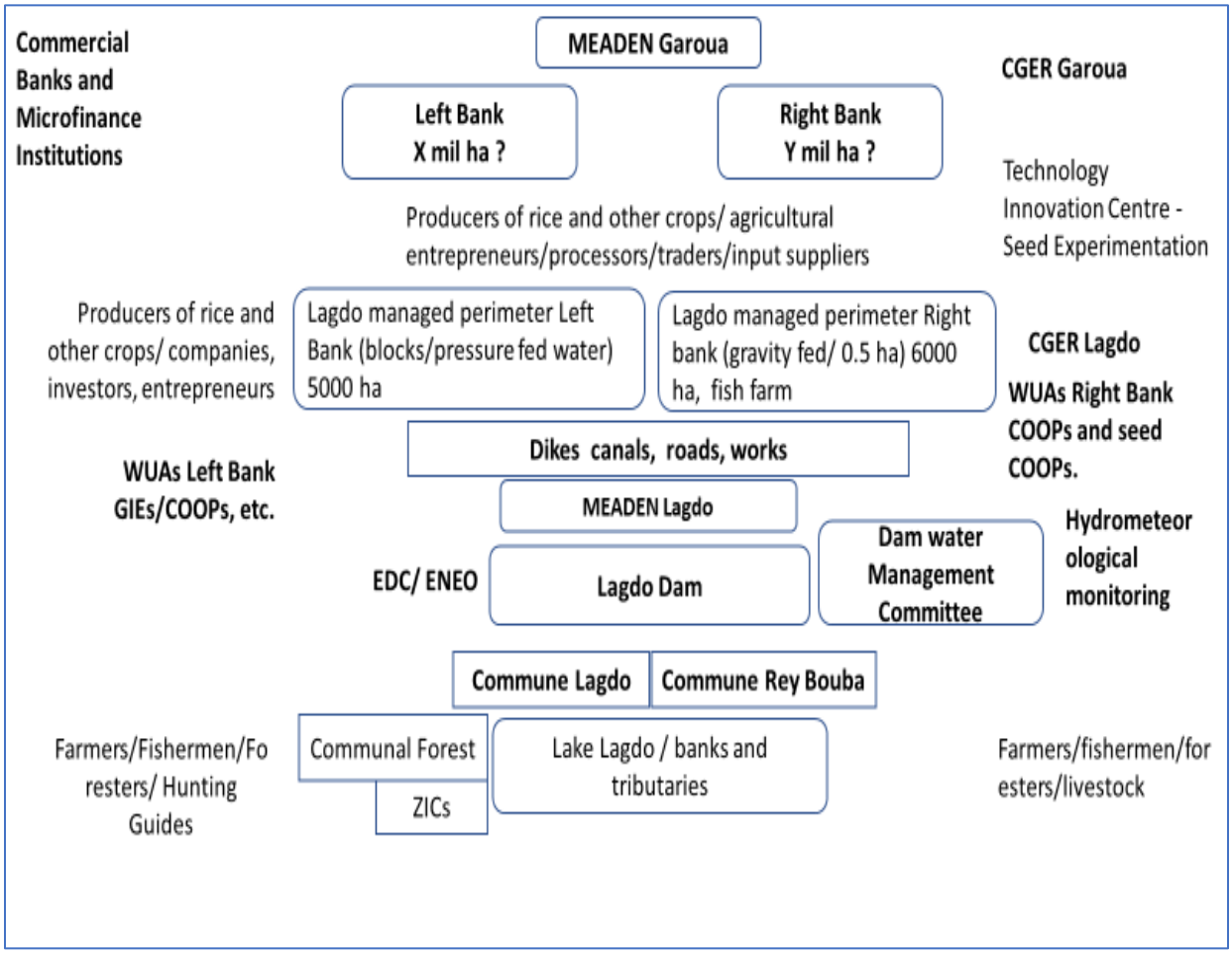


Table 2.1: Type and Cost of Vouchers

Type of voucher (for 0.5-hectare plot)	Year 1 (two crops)	Year 2 (two crops)	Year 3 (two crops)	Total (US$)
Inputs (US$200 for one crop)	50% (200)	25% (100)	0%	300
Water fee (US$50 for one crop)	75% (75)	50% (50)	25% (25)	150
Labor (mechanized work) (US$50 for 1 crop)	75% (75)	50% (50)	25% (25)	150
PLL (US$50 for one crop)	0%	0%	50% (25)	25
Cost of vouchers per farmer (US$)	350	200	75	625

Table 2.2: Summary of E-Vouchers

Year	RB Rehabilitation (ha)	RB Development (ha)	LB Development (number of small farmers in brackets) (ha)	Total Small Farmers (ha)	Vouchers (number)
2022	1,090	1,010	1,400	2,100	4,200
2023		1,900	2,600 (300)	2,200	4,200 + 4,400
2024		1,320	1,121 (400)	1,720	4,200 + 4,400 + 3,440
2025			(800)	800	4,400 + 3,440 + 1,600
2026					3,440 + 1,600
2027					1,600
Total	1,090	4,230	5,121 (1,500)	6,820	40,920

22. **Subcomponent 2.2: Matching Grants for Production and Agribusiness** (US$44.3 million of which US$11.0 million equivalent from IDA and US$33.3 from beneficiaries). This subcomponent will finance: (a) Provision of Matching Grants to Matching Grant Beneficiaries to support activities related to, inter alia, agricultural production, mechanization, agricultural value addition, commercialization, farmer-led irrigation and agricultural service provision ("Sub-Projects") for a minimum of US$9.5 million, and (b) provision of TA, studies and related support for the administration and management of Matching Grants for US$1.5 million. Matching Grants will be provided to producer organizations, associations, cooperatives, entrepreneurial farmers, and established agribusinesses or startups through grant

windows tailored to achieve specific outcomes in terms of improving production, value addition, commercialization, and service provision. Following a call for proposals to submit BPs, grants will be awarded on a competitive basis for up to three years to co-finance eligible sub-projects. Proposals will consist of investments, TA, and working capital and be prepared with assistance from professionals through a consultant. The matching grant facility will be implemented by the PIU and supported by a consultant hired for the duration of the project and its operation detailed in a specific section of the Grants Manual. The subcomponent will finance matching grants, studies, and consultant services.

23. **The project will have three main windows:** one for larger grants (around 100 enterprises for less than US$100,000, subsidy up to 50 percent) based on detailed BPs; one for medium-size investments (about 500 of less than US$6,000, subsidy of 70 percent for men and 80 percent for women); and one for small investments (an estimated 2,000 matching grants of less than US$1,000, subsidy of 80 percent for men and 90 percent for women) based on simplified BPs.[13] Given the number of eligible farmers/agri-businesses, a consultant will be recruited to help implement this subcomponent under the supervision of an agri-business specialist in the PIU. Details will be provided in the Grants Manual. The consultant for preparing BPs will have experience in supporting women farmers and women organization and will be able to adapt the services to their specific needs in order to achieve a target of 30 percent of women for the medium-size and small grants. Which Committee will evaluate the proposals for the large, medium, and small matching grants will be elaborated as part of the preparation of the Grants Manual.

24. **Window for large grants**. This window will finance sub-projects to improve production (e.g. women-run pisciculture from borrow-pits in the perimeter), value addition (e.g. rice de-husking and packaging), commercialization (collection and transport centers, storage systems), service provision (e.g. mechanical maintenance workshops, land mechanization services; and on-farm equipment to the SMEs allocated in the large blocks of the LB irrigation scheme. These activities will help promote crop diversification, including promoting perennial crops that act as carbon sinks, while also promoting efficient water use in the face of water shortages exacerbated by climate change. These would, *inter alia*, include PLL, preparation, harvesting, threshing, planting, etc.), and startups to innovate with low-cost technologies (e.g. linking multiple small- and medium-scale mechanization service providers with small farmers using cell-phone-based registration systems, and 'Mobile Money' – the latter has deeply penetrated into Cameroon's rural areas). Subsidies for larger BPs are expected to be capped at 50 percent of the amount of the BP built over 3 years, with a personal contribution of the promoter of a minimum of 20 percent and a bank credit/statement in the order of 30 percent, primarily covering the needs of working capital, while the grant will finance equipment and works (new buildings, agricultural machinery, plants, drying areas, silos, etc.) and TA.[14] All agribusiness companies directly or indirectly involved in a value chain will be eligible for the larger grants (production, seed, processing, mechanization, irrigation, agricultural machinery, plant protection, etc.). The same company will be eligible to receive only one grant over the duration of the project. The BP will have to be financially viable. The receiving enterprise will have to be in good standing, and detailed financial and market information made available (e.g. financial statements of previous years and the projected financial statements, history of production, marketing and banking history, etc.). The proposal will follow a standardized outline to be detailed in the Grants Manual to be prepared at the beginning of the project

[13] The preparation of business plans for small and medium-size grants will be funded by the project. TA will be provided to the preparation of the large business plans.

[14] World Bank credit will not be a requirement in case a promoter is able to provide the entire counterpart.

and elaborated on the basis of the provisions of the grant handbook for agricultural inputs and equipment from MINADER. The BPs proposals for the larger grants will be evaluated by a multi-stakeholder commission set up by the project under the supervision of the MEADEN, before being transmitted to a partner financial institution (PFI) for evaluation by its credit committee.

25. The subcomponent will finance matching grants, studies, and consultant services. These activities will help promote crop diversification, including promoting perennial crops that act as carbon sinks, while also promoting efficient water use in the face of water shortages exacerbated by climate change. The CGER will ensure the technical and accounting support of the recipient company or farmers' group during the implementation of its sub-project and report regularly to the PFI and to the project.

26. **Window for medium grants**. This window will focus mainly on mechanization services, such as land preparation (power tillers) as well as rice processing (threshers) and similar type of equipment. Poor land levelling and preparation is identified as the single most limiting factor in the Benue and other Cameroon irrigation schemes, resulting annually in 30 percent or more losses in the efficiency of water use, leakage of nitrogen, soil compaction, and ultimately poor production. MEADEN in the North traditionally provides land levelling and preparation services using heavy equipment which compact the soil, require high operational and maintenance costs, and have been provided inefficiently. As a result, land preparation services are often suboptimal, extending to only a portion of the available irrigated perimeters. Proper precision levelling interventions as part of the land preparation routine would improve water use efficiency.

27. A different approach to levelling and land preparation more aligned to good practices in rice producing countries would allow to efficiently regulate soil moisture, which in turn would allow lighter and more efficient machinery, using alternative conservative tillage approaches, especially for incorporating organic matter into the soil. Since smaller and more technologically advanced machines are also more affordable to buy and operate, they would also provide an interesting business opportunity for prospective private service providers who see the potential offered by the rehabilitation of the irrigated areas under the project. The emergence of companies specializing in the maintenance of agricultural equipment and agro-processing will be given priority. The BPs will have to be financially viable. The proposals will need to follow a standardized outline to be detailed in the Grants Manual which is to be prepared at the beginning of the project. Partnership agreements will be established between the project and the various financial institutions involved in the rice sector. The CGER will ensure the technical and accounting support of the recipient company or farmers' group during the implementation of its sub-project and report regularly to the PFI and to the project.

28. **Window for small matching grants (less than US$1,000, subsidy of 80 percent for men and 90 percent for women).** This window will focus mainly in the promotion of farmer led irrigation (small-scale irrigation). For less than a decade, farmers, mainly grouped near the urban center of Garoua, have been irrigating small plots, most often less than 0.5 hectares, with motor pumps from the Benue river or abstraction of shallow groundwater (less than 3 m deep). The spontaneous development of this private initiative small-scale irrigation model seems to be suitable for the production of off-season vegetable crops from October to April, and for complementary irrigation in the rainy season of rice and maize for the months of May to September. Producers use a production strategy, combining and alternating on the irrigated plot crops with different cycles, generating a continuous income stream to meet daily household expenses and production costs. Some crops with high added value, non-perishable such as onions, can reach a price exceeding 80,000 FCFA/bag (about 60 kilograms) on the market. This relative success is catalyzed by growing demand from the city of Garoua.

29. The introduction of manual drilling for the capture of the surface aquifer is at the origin of the rapid expansion of small irrigation previously limited to the immediate surroundings of the Benue and its tributaries with a direct capture in the watercourse. On the LB, the dike road prevents direct pumping into the watercourse, offering no other possibility than capturing groundwater. On this shore, the recent development of manual drilling has increased between 5 to 10 times the individual areas formerly manually irrigated from temporary sumps. Today, the manual drilling technique used, "rapid well jetting," allows drilling in less than an hour to 7 m deep (diameter 50 to 63 mm) at a cost not exceeding 35,000 FCFA. Small local private operators of Garoua and Pitoa, most often working in the informal sector, practice this manual drilling technique, originating in northern Nigeria (Fadama region) where tens of thousands of boreholes have been drilled for small irrigation. However, this manual drilling method hardly penetrates clay horizons with a thickness of more than 2 meters of clay and makes it difficult to carry out drilling beyond a depth of 7 meters, a situation encountered on the RB near Garoua.

30. The groundwater mobilization potential from the irrigated perimeter of Lagdo on the border with Nigeria is significant in the Benue valley in the presence of an unconsolidated surface aquifer of fluvial alluvium with a width of 5 to 15 km, which is very productive and the water level does not change during the year, including during pumping. The pumping rate practiced by producers from manual drilling is around 15 m3/h which is the limit of the controllable rate in earth channels for gravity irrigation. The expansion of manual drilling is closely associated with that of motorized pumping with gasoline pumps, light, easily transportable (less than 30 kilograms) and of low power (3 to 5 horsepower). The presence on the Garoua market of motor pumps from Nigeria (made in China) in a cost range of 70,000 FCFA to 120,000 FCFA, depending on the power and quality, offers the possibility for each farmer to acquire funds and own a pump suitable for his needs and the financial means available to him. The estimated lifespan is between 2 and 5 years, but in reality, it depends on the number of hours of operation, and the attention paid to compliance with maintenance. Water production costs are mainly made up of fuel costs, which can reach 40 percent of the total cost.

31. Despite the cost of fuel (400 to 500 FCFA/liter), this model of small-scale irrigation is a profitable and growing activity. The nature of poorly permeable soils limits the frequency of irrigation (once or twice a week) and the total pumping time and therefore fuel costs. However, the transport of water in gravity channels on land dependent on the topography of the plot considerably increases the duration of irrigation and pumping, in particular due to water losses and the slowing down of the speed of water in canals. For example, the introduction of the technique of water transport by a Californian network, widely used in several countries in West Africa, would reduce by 30 to 40 percent the time spent on irrigation with an investment cost affordable by farmers. The lack of financial support makes it difficult to improve and expand small-scale irrigation in the Benue valley. The investment capacity of producers engaged in this irrigation model is between 100,000 FCFA and 150,000 FCFA for an average area of 0.5 ha. The investment cost of a small irrigation model composed of manual drilling, a low power motor pump, and an efficient water distribution of the Californian network type is less than 500,000 FCFA/ha. This model is particularly well suited to small individual farmers, including women. Access to land is not a problem; it is part of the national domain and therefore operated under the customary law.

32. **Subcomponent 2.3: Establishment of Organizational Management Support Centers** (CGER; US$1.5 million from IDA). The project will finance TA to promote a network of Organizational Management Support Centers (CGERs). An enterprise-based model for the delivery of support services, CGERs will be one-stop-shops that provide smallholder farmers, producers organizations, WUAs, cooperatives, and enterprises with quality assistance services that are affordable and tailored to the

financial capacities of recipients. These services will typically include accounting, FM, procurement, management, and in general all functions that support organizational and governance functions for organized producers and enterprises. The CGERs will adapt those services to take into account the different situations and needs of male and female farmers and organizations composed by and/or led by women using, amongst other sources, the information gathered during regular consultations with women overseen by the Gender Specialist. The model is based on the successful experience promoted by the *Société Nationale d'Aménagement et d'Exploitation des Terres (SAED)* in Senegal. A cost recovery system, starting with partial recovery that will be increased to 50 percent by the end of the project, will start reducing dependence from the project after year 4 of implementation. Two CGERs will be established in Lagdo and Garoua during the first year of implementation. The project subsidizes the establishment of the network (a CGER in Lagdo initially and then a second in Garoua to cover the downstream valley) for several years but in a regressive manner. The operating and sustainability methods of the CGER are described in the feasibility study that is being carried out during preparation. The CGER will establish close collaborative relationships with partner financial institutions for which it can interface with farmers' organizations and all companies involved in the rice and other sectors. Services will be billed to users according to a pre-established schedule. The CGER will recruit its staff and covers its expenses.

Component 3: Capacity Building and Implementation (US$33.0 million of which US$26.0 million equivalent from IDA and US$7.0 million from GoC)

33. This component will finance *public sector functions and institutions,* especially: (i) MEADEN's role as a public institution responsible for the development of the whole of the North province, (ii) public schools and research centers, and (iii) the project implementation through a PIU.

34. **Subcomponent 3.1: Institutional Strengthening** (US$5.0 million from IDA). MEADEN is the primary institution responsible for a strategic vision for the development of the North and water resource development, reporting to MINEPAT. For the purpose of modernizing MEADEN, an institutional transformation plan for MEADEN will be prepared and presented to the World Bank no later than 6 months after effectiveness (as a dated covenant), with detailed recommendations for its reorganization with a 3-year timeline implementation period. The plan will be cleared by the World Bank, will have objectives, actions, responsibilities, timing, and costing for a 3-year implementation with clear milestones. During project implementation, the Bank will monitor the plan and review the milestones in order to provide the necessary support. During the Mid-term Review, the implementation of the reorganization plan will be assessed and corrective measures will be taken, if necessary. This subcomponent will focus on the reorganization of MEADEN and training of its staff. Specialized intensive training will be provided to the staff of new specialized units like the Water Resource Unit (for supporting the Water Management Committee of Lagdo dam/*Comité de Gestion de l'Eau du Barrage de Lagdo*) and a WUAs Oversight Unit.

35. MEADEN's proposed new organization structure is shown in Figure 2.3 below. The new structure will take account of the proposed transfer of functions, such as management of water within the perimeters to the WUAs and of functions such as land preparation, rice milling and marketing, transport and most maintenance of equipment to the private sector. At the same time, the structure reflects the proposed strengthening of MEADEN's important roles in regional planning, oversight, support and research, and the management of the irrigation infrastructure. The total new establishment will include around 34 personnel plus support staff.

36. GoC authorities undertook a study visit in January 2018 to the SAED operations in the Senegal river's delta, where WUAs are operating efficiently. Following the same model, funds would be provided to continue the South-South partnership with SAED, and to develop arrangements between MEADEN and the WUAs similar to the ones operating in Senegal.

37. **MINADER is fundamental for ensuring extension services on the irrigation scheme.** A MoU will be elaborated for ensuring MINADER actively deploys qualified extension agents to the project area. It was agreed a minimum of one extension agent per every 250 ha. This is essential, particularly during the first few years of project implementation, so that double cropping will be achieved on the majority of the land.

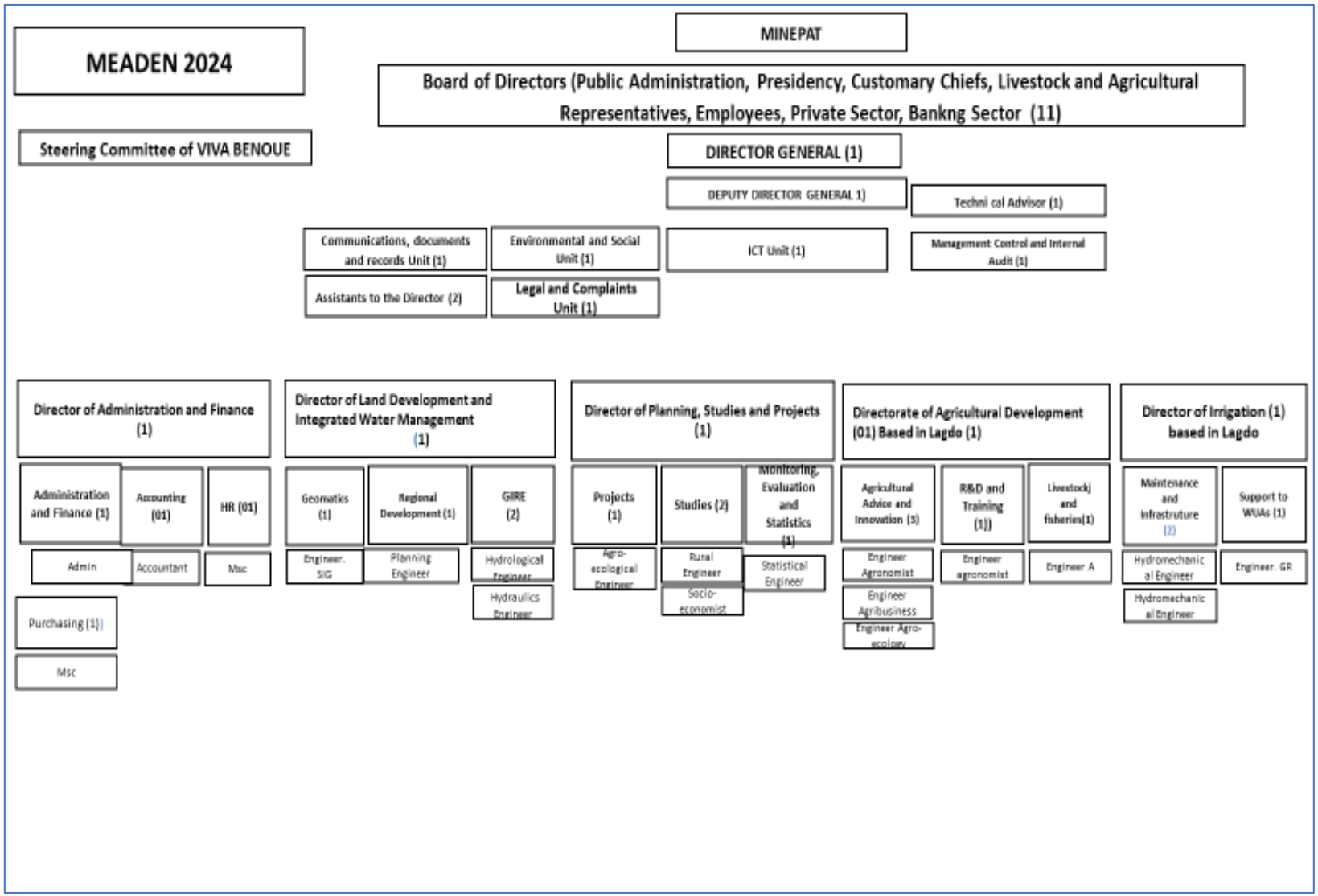
38. **Subcomponent 3.2: Agricultural Innovation and Training** (US$5.0 million from IDA). The project will support MoUs for improving irrigated agriculture with education/training institutions in the Benue valley at three levels: (i) higher education such as the University of Maroua, *Ecole Technique d'Agriculture de Garoua;* (ii) technical and vocational training such as *Lycée technique du Centre professional Agricole à Lagdo*; and (iii) at local level through the creation of the Technical Innovation Center (TIC)/*Centre d'Innovation Technologique (CIT).*

39. At higher education as well as at technical and vocational training level, MoUs with education providers such as the University of Maroua, *Ecole Technique d'Agriculture de Garoua*; and various Technical and Vocational Training Centers (public and private) will be established in order to develop training programs in all the disciplines of irrigation: from work construction to irrigated agronomy. The objective will be to reinforce and strengthen local capacities in these subjects.

40. At local level, innovation will be supported by financing a newly created CTI. Established at the heart of the Lagdo perimeter, the CIT will be set up as an association with a board of directors, including key stakeholders of the Benue Valley (WUAs, Cooperatives, CIG, CRPA, CNPC-C, IRAD, SODECOTON, MINADER, and MEADEN). The establishment of the CTI will be part of the agreement of the TA of Subcomponent 1.3 and 2.1, while the support for the implementation will be subject to specific agreement between the PIU and the newly established CTI. The CTI will be producing pre-basic seeds and monitor basic and certified seed production. The PIU will have an agronomist specializing in technological innovation, and will work in partnership with IRAD and Africa Rice within an MoU for provision of TA.

41. Agricultural vocational and technical training will be promoted to transfer the innovations tested by the CTI, including on two demonstration farms, to the relevant stakeholders of the Benue Valley and to the various agricultural training institutions in the region. The CTI will periodically organize demonstrations and training sessions in the Benue Valley for rice producers, extension agents, teachers, students, and other relevant categories with an emphasis on small-scale production, mechanization, and small-scale irrigation.

Figure 2.3: MEADEN's Proposed New Organization Structure



42. **Subcomponent 3.3: Project Implementation and M&E Support** (US$23.0 million of which US$16.0 million from IDA and US$7 million from GoC). After a competitive selection agreeable to IDA and validated by the PSC, MEADEN, on behalf of the PSC, will contract technical staff for the PIU. PIU staff will be initially contracted for the duration of one year, renewable based on positive performance evaluations. The project staff will have the status of consultants and will be financed with the resources of the project. Additional specialists will be hired as deemed necessary during implementation. The hiring process will target experienced staff with proven credentials in their areas of competence and who are familiar with World Bank and/or other donors' procedures. The performance of the entire PIU team will be evaluated annually. The Coordinator will sign a performance contract with the supervising ministry (MINEPAT), while contracts of the other members of the PIU will be signed with the Coordinator on behalf of the MINEPAT.

43. The PIU will facilitate implementation of the project, M&E, FM, and procurement. The PIU will have the following responsibilities: (i) consolidating annual work programs and budgets; (ii) facilitating the implementation of project activities; (iii) ensuring that project implementation is carried out in conformity with the project implementing manuals: technical, M&E, financial, procurement, and disbursement procedures agreed between the PIU and the World Bank; (iv) M&E; and (v) preparing and transmitting technical, financial, E&S safeguards, and M&E reports to the PSC, RTMT, the World Bank, and other key stakeholders.

44. The PIU will include: a Coordinator, an Administration/Financial Specialist, an FM Specialist, a Senior and a Junior Procurement Specialist, two Accountants (one for general work and one for the vouchers), an Internal Auditor, a M&E Specialist, an Environmental Specialist, a Social Specialist, a Gender Specialist, a Lawyer, a Communications Specialist, an IT Specialist, a Hydrologist, an Engineer, a Works Control Specialist, an Agronomist (to oversee Subcomponent 2.1), an Agri-business Specialists (to oversee Subcomponent 2.2), an Agricultural research Specialist, an On-farm Water Management and Farm Mechanization Specialist, and a Communications Specialist. Additional offices will need to be constructed in Lagdo.

45. In addition, all the necessary studies to undertake this project directly (feasibility, ESIA, etc.) or indirectly (CGER study, small-scale irrigation, etc.) are included in this subcomponent.

Component 4: Contingent Emergency Response Component (CERC) – US$0 million from IDA

46. The CERC will be established and managed in accordance with the provisions of World Bank Investment Project Financing Policy paragraphs 11, 12, and 13. The project's CERC will be triggered only when requested by Government providing evidence of eligibility of the emergency. If the World Bank agrees with the determination of the disaster and associated response needs, this component allows the Government to request the World Bank to recategorize and reallocate financing from other project components to cover emergency response and recovery costs. Disbursements would be made against a list of critical goods or procurement of works and consultant services required to support immediate response and recovery needs. A specific Emergency Response Operations Manual will apply to this CERC component that will include detailed operational guidelines for implementation, and its approval by the World Bank will be a disbursement condition.

47. Arrangements for the CERC. All expenditures under the CERC will be appraised and reviewed to determine if they are acceptable to the World Bank before any disbursement is made. Disbursements will be made against an approved list of goods, works, and services required to support crisis mitigation, response, recovery, and reconstruction.

48. **Project Implementation Manual (PIM)**. The PIM has been completed and approved. The PIM covers the following areas: general purpose of PIM, project history, objectives and components, implementation timeline, institutional arrangements, landscape's overview, beneficiaries and location, budget, accounting policies, system of accounting and financial reporting, administrative procedures (operating procedures, and management of fixed assets). Six separate Manuals (E-vouchers, Matching Grants, WUA, Scholarships, FM Procedures and M&E) will detail the specific arrangements for those categories.

49. **Annual Work Plan (AWP)**. No later than November 30 each year (or one month after the effectiveness date for the first year of project implementation), the Government will prepare a draft annual work plan and budget for the project for the subsequent calendar year of project implementation to be reviewed by the World Bank. AWPs and budgets may be revised as needed during project implementation, subject to prior written approval by the World Bank.

Monitoring and Evaluation

50. Project-level M&E systems, which will be detailed in the M&E manual, will track progress during implementation, measure intermediate outcomes, and evaluate project impacts. The M&E system will capture information on project results against the targets set as part of the RF.

51. To inform RF indicators at project inception, a baseline survey is being conducted before Board presentation. Beneficiaries will be surveyed subsequently in year 3 (mid-term) and year 6 (project end) to track changes in their livelihood conditions attributable to the project. As the implementing unit, the PIU will be responsible for the overall monitoring and reporting of project progress. In addition to regular monitoring and reporting on the agreed project indicators, activities to be monitored include the timely, efficient, and transparent supervision of procurement and contract management; construction of canals; effective implementation of the ESMP and RAP; and successful completion of studies and training activities.

52. Progress reports will be prepared for each semester of project implementation and will be submitted to the World Bank no later than 45 days after the end of the period covered by the reports. Monitoring of results and outcomes, in accordance with the project's RF (Section VII), will be reported in the project progress reports. An M&E specialist will be retained at the PIU to implement and coordinate all M&E activities under the project. Furthermore, the World Bank will supervise the project over its lifetime. Up to the Mid-Term Review (MTR), which will be carried out no later than four years after effectiveness, the project will produce semi-annual reports. The MTR will reassess the periodicity of project implementation reports as may be required.

ANNEX 3: Economic and Financial Analysis

Introduction

1. The EFA is an integral part of the project development cycle, being necessary for the justification of the investments (about US$200 million IDA and an additional US$61 million of local contributions by private entities), and for supporting the project design process in selecting the best design options for attaining the defined PDOs. The EFA should verify if the investments are justified from the point of view of the beneficiaries (financial analysis) and for the country's economy (economic analysis).

Methodology for the EFA

2. The analysis was prepared together with the counterpart team and is based on relevant data collected since the January 2018 World Bank mission. A preliminary assessment based on "with and without project" scenarios were presented in the draft PAD in October 2019, including the proposed investments for the RB of the project. During the December 2019 and February 2020 World Bank missions, the preliminary scenarios were revised and completed with the proposed LB development, as new project design details were made available. The new scenarios and EFA results are presented below.[15] These scenarios were prepared for estimating the incremental costs and benefits that the project interventions and activities would induce under the three complementary components. The corresponding results indicators include: (i) the financial impact at the level of the beneficiaries, measured mainly by the expected increases in net family revenues in the case of small farmers and by the internal financial rates of return (FRR) in the case of bigger farmers from the LB beneficiaries, using market prices; and (ii) the economic impact for the country's economy through the expected ERR and the economic NPV. For the economic analysis, relevant conversion factors (CF) were used to estimate the economic (or shadow) values of costs and benefits, net of market imperfections, mainly subsidies and taxes.

3. Rice is and will continue to be the primary and most important production activity in the project's irrigated areas. Developing a more efficient rice production value chain is necessary (but not sufficient) for justifying the proposed project investment. Rice production is already the main activity in the area, generating significant benefits in the existing irrigated 600 ha, using water from the Lagdo reservoir, and it constitutes a strong base for justifying the proposed investments, given the assured potential domestic and regional unsatisfied growing rice markets.[16] Other higher value crops and activities also offer even higher potential returns, but developing their production technologies, value chains, and market linkages will take several years.

4. This Annex presents the VIVA Benue EFA, considering the proposed investments in the Lagdo project area including: (i) rehabilitation and modernization of the existing 1,090 ha of irrigated land on the RB (Phase I); (ii) development of an additional 4,230 ha with irrigation, also on the RB (Phase II); (iii) development of 5,121 ha for irrigation on the LB (Phase III); (iv) diversification and development of higher value production activities (vegetables, onions, banana, papaya, mango, passion and other fruits,

[15] FARMOD software was being used for the analysis.

[16] The rice sector is widening the deficit in the trade balance in Cameroon. The peak was recorded in 2017 with a volume of 628,400 tons of imported white rice valued at nearly FCFA 184 billion. National paddy rice production, estimated at nearly 333,076 tons in 2017, has been almost stagnant since 2011. However, the objective of the National Rice Production Development Strategy, drawn up in 2007, is to produce 750,000 tons rice by 2020.

and aquaculture); (v) development of mechanization and other services provision to improve production technologies; and (vi) strengthening of the rice, onions, vegetables, fruits and aquaculture value chains by improving the post-harvest handling and processing through the development of farm and agribusiness enterprises, including farmers' organizations, promoting productive alliances among different stakeholders, and developing linkages between farmers and markets. These post-harvest investments would be fast-tracked by the project through competitive calls for the presentation of proposals to be supported through the project provision of TA and matching grants, involving demand-driven initiatives about the production and processing of rice, onions, fruits, vegetables, aquaculture, etc. The value chain approach and vertical integration processes to be reinforced will reduce production costs and improve the price of rice and other products being sold by farmers as well as the net income derived from their farming activities.

The EFA Scenarios

5. The starting point for the development of the alternative production models, including "with and without the project" scenarios, was the preparation of representative crop and activity budget models. Yields, prices, inputs, labor, household on-farm consumption, costs, and resulting revenues were estimated to quantify the net incremental benefits that are, and could be attained, through the project supported interventions at the farmers' level. Support activities like irrigation infrastructure improvements, TA, and other production services provision for enhancing productivity, and value chain development were also considered and modeled. A second level for building the EFA scenarios was the preparation of farm and agri-business models where crop and activity models were combined based on realistic cropping patterns, showing expected beneficiaries' income increases to verify the attractiveness that farmers would have for changing their current activities. The third assessment level was to combine farmers' activities for the three project phases to quantify aggregate benefits and the costs involved in the rehabilitation or development of the irrigation perimeters, from the perspective of the country's economy.

Crop and Activity Models

6. On average, farmers are supposed to have (or will be given in the new perimeters) 0.5 ha of irrigated land where most of them plant (or will plant) rice and/or other crops in two seasons every year: the dry and the wet seasons (DS and WS). Most of these farmers usually also have and cultivate one to two ha outside the irrigation perimeter under rainfed conditions, where they grow mainly maize, cowpeas, cotton, groundnut or other traditional crops during the WS and sorghum in the DS.

7. For the case of rice cultivated in DS and WS (per ha), the current irrigated areas *to be rehabilitated* (and/or areas to be developed) together with other project support interventions were assessed. This included the costs and revenues under the current technology (without project), along with the expected changes to be induced in subsequent years (new technology) through the improved irrigation systems, together with the adoption of the climate-smart technologies as the SRI.[17] SRI includes the introduction of laser land leveling (LLL), alternate watering and drying (AWD)[18] irrigation

[17] The SRI is an innovative agro-ecological methodology that aims to increase yields and farmer's profits by creating the most suitable environment for the rice plant to grow and produce higher yields.

[18] AWD is a water management system that aims to reduce the water use in irrigated rice fields without lowering productivity. Under AWD, rice fields are alternately flooded and un-flooded rather than kept continuously submerged like under conventional rice farming. By also reducing the number of plants per ha, this allows the roots to better develop reaching more nutrients and oxygen, resulting in bigger and healthier plants with more and heavier rice grains.

method, and a reduced use of inputs and production costs. Project-induced changes also assume an adequate mechanization of selected practices (land preparation, transplanting, mechanical harvesting, etc.), and several post-harvesting processes to be technically and financially supported under Components 1 and 2.

8. The expected results from the rehabilitated or developed infrastructure - together with the adoption of SRI technologies and the improved post-harvesting handling of rice would be threefold: (i) a 60 percent average increase in yields per ha, from 4 to 6.5 metric tons (mt);[19] (ii) a reduction in the use of irrigation water, seeds, fertilizers, and agrochemicals; and (iii) a reduction in the use of labor (mainly through the use of land preparation and transplanting equipment, small harvesting machines, etc.). The resulting net revenues per ha of rice before family labor would be increasing two to threefold, from FCFA 96,900 to FCFA 349,000 in the DS and from FCFA 89,600 to FCFA 302,600 in the WS.

9. Similarly, other crops in the new areas to be developed with irrigation -- both on the right and left banks of the project area -- show similar or higher returns to the project support interventions. Onions is the second most frequent irrigated crop in the project area, which provides also good perspectives for development, provided that post-harvesting arrangements and adequate linkages to the markets are supported (including post-harvest handling and adequate storage facilities for selling the onions during the off-harvesting season). Onion production selling off-season could offer more than twice the net income of rice. Rice and onions, with the required support, could help significantly in justifying the project irrigation investments, at least until other higher-value cropping alternatives and their value chains are developed in parallel.

10. Many other HVC with reliable irrigation could offer relevant diversification alternatives in the project area. Fruits (papaya, banana, passion fruit, pineapple, mango, guava, etc.) and vegetables (tomato, capsicum, eggplant, watermelon, melon, etc.), are some alternatives that could provide a significant contribution to the development of the new irrigated areas with the necessary value chain support foreseen under the project. Examples of potential HVCs include: banana, papaya, passion fruit, mango, tomato, and watermelon. These fruits and vegetables also offer more profitable options than rice, especially (but not only) for the more entrepreneurial farmers to be settled on the LB. As these options are developed over time, these alternatives could end up providing about three to five times the net revenues derived from rice, and in the case of fruits, offering FRR that could vary from 21.8 to 45.3 percent.

11. Aquaculture (tilapia) in small, on-farm, 300 m^2 earth ponds is another complementary activity for landless women and/or youth family members in areas where water is available from the irrigation perimeter or from any other source.[20] As can be seen, with proper technical and value chain development assistance, in a 300 m^2 pond it is possible to produce, during two six-months cycles, an average of 600 kg of tilapia per year, generating more than 10 times the income (after labor costs) than in an equivalent area under irrigated rice. Catfish production in farm ponds could also offer similar results than tilapia. Fish is the cheapest source of protein and could play an important role in improving

[19] Yields would increase from 4.2 to 6.8 mt in DS, while in WS yields would grow from 3.8 (Table 3.1) to 6.2 mt (Table 3.2).
[20] Cameroon plans to reduce massive fish imports by developing *aquaculture* which appears to be the great solution to the massive demand for *animal protein*. The species which contribute to the bulk of the Cameroon fish production are tilapia, North African catfish and common carp. The tilapias are a sturdy species which is able to support extreme water temperatures and low levels of dissolved oxygen. Natural breeding occurs in virtually every type of water. There are several species in Cameroon, of which the Nile tilapia (Oreochromis niloticus) is the most attractive for fish farming purposes.

the diet of the poor and contributing to poverty alleviation in Cameroon's poorest northern regions as it is happening in other countries in similar environments (Nigeria, Kenya, Egypt, etc.).

12. Irrigated maize and soybeans are also possible crops that could provide similar or higher income than rice in the rehabilitated or new perimeters.

13. In order to represent the beneficiaries' current typical farm activities and compare them to those production systems to be developed with the project, several **farm models** are presented in the next section. Irrigated and rainfed crops (cultivated outside the perimeters), including paddy rice, maize, sorghum, groundnuts, cowpeas (niebe), and cotton are also feasible. Most of the rainfed crops produce the base for the traditional diet in the project areas and are assumed to continue that function.

14. The following Table 3.1 summarizes the main parameters and resulting gross and net revenues being derived "without project" (WoP) and those expected to be attained "with project" (WP).

Table 3.1: Crop and activity models without and with project (in FCFA)

	Crop/Activity	Gross Revenue		Input Costs		Income Before Labor		Labor Costs		Net Revenue		Increments
Table		WoP	WP	WoP	WP	WoP	WP	WoP	WP	WoP	WP	(before labor)
1	Rice Dry Season	504,000	816,000	405,100	467,000	98,900	349,000	172,000	70,800	-73,100	278,200	353%
2	Rice Wet Season	456,000	744,000	366,400	441,400	89,600	302,600	168,000	68,400	-78,400	234,200	338%
3	Onions	900,000	1,500,000	387,500	504,000	512,500	996,000	234,000	297,600	278,500	698,400	194%
4	Banana	-	2,500,000	-	948,000	-	1,552,000	-	288,000	-	1,264,000	IRR=34%
5	Papaya	-	1,300,000	-	503,000	-	797,000	-	122,400	-	674,600	IRR=22%
6	Passion Fruit	-	2,000,000	-	318,000	-	1,682,000	-	157,200	-	1,524,800	IRR=33%
7	Mango	-	3,750,000	-	648,000	-	3,102,000	-	420,000	-	2,682,000	IRR=45%
8	Tomate	1,560,000	2,600,000	482,000	727,400	1,078,000	1,872,600	446,400	657,600	631,600	1,215,000	174%
9	Watermelon	1,620,000	2,700,000	257,000	569,000	1,363,000	2,131,000	142,800	184,800	1,220,200	1,946,200	156%
10	Tilapia	-	900,000	-	720,000	-	180,000	-	57,600	-	122,400	IRR=18%
11	Maize Irrigated	330,000	770,000	235,000	351,000	95,000	419,000	133,200	152,400	-38,200	266,600	441%
12	Soyabeans	320,000	560,000	80,600	221,900	239,400	338,100	124,800	40,800	114,600	297,300	141%
13	Rice rainfed	360,000	396,000	236,700	236,700	123,300	159,300	121,200	121,200	2,100	38,100	129%
14	Maize rainfed	220,000	330,000	155,500	221,900	64,500	108,100	157,200	177,600	-92,700	-69,500	168%
15	Sorghum rainfed	192,000	240,000	39,300	66,200	152,700	173,800	84,000	88,800	68,700	85,000	114%
16	Groundnuts	500,000	650,000	234,000	268,500	266,000	381,500	124,800	139,200	141,200	242,300	143%
17	Cowpeas	360,000	720,000	260,600	385,200	99,400	334,800	110,400	129,600	-11,000	205,200	337%
18	Cotton	300,000	375,000	133,100	160,500	166,900	214,500	121,200	132,000	45,700	82,500	129%
19	Traditional cow	128,750	189,250	67,500	96,000	61,250	93,250	57,600	57,600	3,650	35,650	152%

15. As can be seen in Table 3.1 from the average net revenue values, rice production with the adoption of SRI available new technologies (including AWD, LLL, adequate milling, etc.) could more than triplicate the current net revenues before labor costs (the relevant indicator for beneficiaries in the project area, since most activities are based on family labor, and they have almost no employment opportunities). Onions could provide more than two times the returns from rice during the DS (even when applying rice improved technology), but only if adequate storage and market linkages are available, and onions could be sold off-season.

16. Other HVCs, such as tomato and watermelon, could offer four to six times the returns from rice with the new technologies, but once again, only if the respective value chains are developed and adequate linkages with markets allow farmers to access the domestic and regional markets. With banana, papaya, and mango alternatives, farmers could even further improve the resulting revenues, but only if adapted technology is applied, and farmers have sufficient investment capacity for allowing

them to wait for the longer periods for harvesting, besides the development of the value chain and market linkages. All these potential production opportunities will depend on the correct implementation and management of the holistic approach proposed by the project, aimed to be developed with capable TA and adequate instruments for sharing the financial risks that farmers will be required to undertake.

Farm Models

17. Farm models were prepared and analyzed for the existing and expected beneficiaries' situations before and after the project support interventions. The current farms (Phase I) are cultivating 0.5 ha both during the WS and DS on the existing 600 ha with rice or other crops (onions, tomato, etc.) under irrigation (400 ha). Phase II beneficiaries are currently cultivating 1.5 rainfed ha, that would be allocated in 0.5-, 1.5- or 3-ha irrigated parcels on the RB perimeters. Small-scale irrigation will also be developed outside the perimeters where farmers will be supported to irrigate small plots, most often less than 0.5 hectares, with motor pumps from the Benue river or from the catchment with manual drilling of shallow groundwater (less than 7 m deep). Finally, entrepreneurial farms are to be developed on the LB perimeter (Phase III). Those models include different cropping patterns, production parameters, and most of the other variables that determine the farm benefits.

18. These representative farm models were prepared for estimating the financial impact of the project at the level of beneficiaries. The crop and activity models in the previous section were combined based on typical cropping patterns and farm sizes, available family labor, production yields, costs of production, and consumption parameters. These models allowed estimating average household net incomes without and with the project, and quantifying how the project could increase beneficiaries' revenues and resulting net benefits.

19. **Farm Models 1 to 3 (Phase I; see Table 3.2).** These three typical half-a-hectare parcels -- within the existing irrigated perimeter to be rehabilitated as Phase I -- cultivate in the first two models rice twice a year and adopt the SRI technologies with the project. In Model 2 farmers would add to the improved rice crops a 300 m^2 pond for tilapia production.[21] In Model 3, farmers are currently cultivating other irrigated crops (onions, tomato, and watermelons). Most of these farms include, in addition to the irrigated parcel, about 1.5 ha of rainfed plots outside the perimeter where they grow maize, sorghum, groundnuts, cowpeas and/or cotton. Farm Model 3 also represents the beneficiaries being allocated 0.5 ha parcels in the LB (Phase III). Table 3.2 below summarizes the main results.

Table 3.2: Farm Models (FM) for Phase I for Existing farmers (Right Bank)

			Gross Value Production (in '000 FCFA)		Net Value Production (in '000 FCFA)		Returns/familyday work (in FCFA)		Main Crops 1/	
	# Farms	Area Total (ha)	Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
Phase I	2,180	1,090								
FM 1(0.5 ha)	1,200	600	1,142	1,675	423	825	1,122	2,527	M,S,G,R	M,S,G,R
FM 2 (0.5 ha)	580	290	1,221	2,639	436	950	986	2,240	M,S,C,R	T,M,S,C,R
FM 3 (0.5 ha)	400	200	1,231	2,046	701	1,280	2,604	4,139	M,S,C,G	M,S,C,G

1/M: maize; S: sorghum; G: groundnuts; R: rice; C: cowpeas; O: onions; T: tomato; P: papaya; B: banana; Mg: mango; Pf: passion fruit

[21] Areas reserved for fish ponds (minimizing risks of chemical contamination or floods) would concentrate the aquaculture activities to be undertaken by women and youth groups.

20. **Farm Models 4 to 6 (Phase II; see Table 3.3).** This second group of models represents farmers to be settled in the new Phase II areas on the RB. They are farmers currently cultivating about 1.5 ha with traditional rainfed crops outside the new development. Model 4 characterizes farmers that would add to their current activities a 0.5-ha irrigated parcel within the new perimeter, while Models 5 and 6 would be allocated 1.25- and 3-ha irrigated parcels, respectively. Model 4 would begin cultivating rice in the 0.5-ha new parcel, while Model 5 represents farmers that, besides food crops, are also planting onions, and would receive a 1.5-ha irrigated parcel. They would increase onion production under double cropping on 0.8 ha and develop banana on the other 0.7 ha in the irrigated plot. Model 6 shows farmers being allocated 3-ha irrigated parcels. They would include double cropping of onion and plant papaya (1.5 ha each). All three Phase II models would continue cultivating about 1.5 ha in their rainfed lands, mainly for self-consumption. Besides the farm improvements represented in Models 1 to 6, a tilapia activity model for a 300 m^2 pond is was also analyzed for supporting landless women and youth initiating aquaculture. Table 3.3 below show the current main farm model parameters and the expected changes with the project, including the tilapia activity. Farmers are expected to increase their income between 2- and 11-times, subject to the allocated areas (0.5 to 3 ha of irrigated parcels).

21. **Farm Model 7** represents farms to be supported with small-scale irrigation in the Benue valley outside the perimeters, oriented towards the production of counter-season vegetable crops (October to April), and complementary irrigation of rice and maize during the WS. They would irrigate small plots (averaging 0.5 ha) with motor pumps from the river or from the catchment with manual drilling of shallow groundwater supported with small grants of about US$1,000.

Table 3.3: Farm Models for Phase II Farmers (Right Bank)

			Gross Value Production (in '000 FCFA)		Net Value Production (in '000 FCFA)		Returns/familyday work (in FCFA)		Main Crops 1/	
	# Farms	Area Total (ha)	Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
Phase II	**7,504**	**4,435**								
FM 4 (0.5 ha)	7,000	3,500	605	1,404	298	644	1,192	2,934	M,S,C	P,M,S,C
FM 5 (1.25 ha)	330	413	952	9,902	566	4,900	2,031	10,276	O,M,S,G	B,O,M,S,G
FM 6 (3 ha)	174	522	690	10,262	413	4,578	1,689	10,128	O,M,S,G	P,O,M,S
FM 7 (0.5 ha outside)	708	354	476	1,607	237	884	1,172	3,810	M,S,C	R,O,M,S,C
Tilapia Ponds	**1,500**	**75**	-	600	-	180	-	3,750	-	Tilapia

Note: M: maize; S: sorghum; G: groundnuts; R: rice; C: cowpeas; O: onions; T: tomato; P: papaya; B: banana; Mg: mango; Pf: passion fruit

22. **Farm Models 8 to 13 (Phase III).** These six models represent about 122 entrepreneurial farmers to be settled in the new irrigated areas on the LB with about 30 ha each. They would be farmers willing to invest in modern commercial irrigated agriculture. The LB 5,014 ha perimeter would be developed with pressurized irrigation, of which about 3,625 ha would be allocated for agro-industrial farms and about 1,400 ha for small farmers (about 2,800 households represented by the Farm Model 3 described above). The 122 agro-industrial farmers will have to install the on-farm irrigation systems (sprinklers, bubble, drip, etc.) with an average estimated cost of about US$3,800 per ha. It was assumed that, for the concession of the land with the off-farm pressurized irrigation investments,[22] the agro-

[22] It was assumed an investment cost of US$12,000 per ha the development of the off-farm pressurized irrigation system in the left bank (including contingencies and taxes).

industrial farmers allocated on the LB will pay about FCFA 400,000 (US$660) per hectare per year as leasing cost.[23] Model 8 represents farmers that would plant 30 ha with rice during the WS and processing it into white rice; and 30 ha with watermelon during the DS. Models 9 and 10 would also plant and process 30 ha of rice in the WS, and 30 ha with onions (Model 9) or tomato (Model 10) during the DS. For the last two models, on-farm packing facilities would allow produce to be bagged or boxed, transported and sold in the distant domestic and regional markets. Model 11 was assumed to plant banana on the 30 ha, packing the fruit in their own facilities, and transporting it to the markets. Model 12 represent other risk-taking entrepreneurial farmers that could develop a 30-ha papaya plantation and the fruit packed on-farm and sent to the markets. Finally, Model 13 assumed to develop mango and passion fruit orchards (15 ha each), also with their own packing and transport services. Table 3.4 shows the main production values and expected financial results for Phase III agro-industrial farms.

Table 3.4: Farm Models for Phase III Entrepreneurial Farmers (Left Bank)

			Gross Value Production at maturity year		Net Value Production after packed and transported to markets		FIRR of Entrepreneurial Farmer Investments		Main Crops 1/	
			(in '000 FCFA)		(in '000 FCFA)		(in FCFA)			
	# Farms	Area Total (ha)	Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
Phase III	**122**	**3,660**								
FM 8 Ph III (30 ha)	15.	450	-	103,320	-	54,188	-	40.9%	-	R,W
FM 9 Ph III (30 ha)	29.	870	-	195,328	-	81,638	-	24.8%	-	R,O
FM 10 Ph III (30 ha)	15.	450	-	158,320	-	59,488	-	27.8%	-	R,T
FM 11 Ph III (30 ha)	22.	660	-	164,900	-	59,748	-	16.7%	-	B
FM 12 Ph III (30 ha)	19.	570	-	105,600	-	35,207	-	14.7%	-	P
FM 13 Ph III (30 ha)	22.	660	-	184,660	-	110,625	-	16.8%	-	Mg,Pf

Note: M: maize; S: sorghum; G: groundnuts; R: rice; C: cowpeas; O: onions; T: tomato; P: papaya; B: banana; Mg: mango; Pf: passion fruit

Production Services and Post-harvest Agribusiness Models

23. The financial and economic viability of the proposed irrigation infrastructure development costing about US$150 million depends on: (i) the adoption of improved production technologies that could allow significant land and water productivity improvements;[24] and (ii) the development of the value chains for rice, onions, and other HVCs to link producers with markets ensuring adequate marketing and prices for their production. Both targets should be developed simultaneously in order to generate the benefits required to justify the investment.

24. In this section (i) three production services models are presented, representing business opportunities for prospective private service providers who see the potential offered by the project matching grants and the rehabilitation and expansion of the irrigated areas, as well as (ii) seven post-harvesting models showing the value chain development of several products, including post-harvesting facilities for rice, onions, tomato, banana, papaya, passion fruit/mango, and tilapia. These models would be developed by individuals or groups of farmers and/or entrepreneurs with the technical and financial

[23] The leasing fee of US$660 per ha per year would allow MEADEN to recover the full cost of developing the allotted area for agro-industrial farms in about 20 years-time.

[24] Poor land levelling and preparation is identified as the single most limiting factor in the Benue and other Cameroon irrigation schemes, resulting annually in 30 percent or more losses in the efficiency of water use, leakage of nitrogen, soil compaction, and ultimately poor production.

support of the project.[25]

25. **As Production Services Provider Models,** three cases are presented. The first case involves a large service provider with two 70–75 HP 4WD tractors and implements (3 disks plow, harrow, rotovator, laser land levelling (LLL), seeding, harvesting, thresher, and transplanting equipment) for servicing more than 200 ha (400 farms). By charging tariffs well below the current ones charged in the area, and using a US$50,000 matching grant together with a US$30,000 commercial loan , the operator would attain an FRR of 36.3 percent. The second and third service provider models involve smaller individual-operators that would acquire a monoculture equipment for land preparation in the first case, and a small harvesting and threshing equipment for servicing about 40 ha (80 small farms), respectively. In both cases the service provider would be supported with a US$5,000 project grant to cover 60 to 80 percent of the investment. The FRR in these last two cases would be 51 and 28 percent.

26. **Two Rice Milling Models were also considered** Basically, rice milling is the process that helps in removal of hulls and brans from paddy grains to produce polished rice.[26] In the first case it was assumed a milling capacity of 360 mt of paddy per year with a mini rice mill unit costing FCFA 3.75 million (US$6,250), including the required equipment and assets. It was assumed that 80 percent of the investment (FCFA 3 million, equivalent to US$5,000) would be provided as a project grant. With this processing capacity, every 30 ha of rice cropped, both during the WS and DS, could justify the establishment of an improved mini rice milling unit, having a processing capacity of about 2 mt/hour. Polished bagged rice (62.5 percent of polished rice from paddy) is assumed to be sold at FCFA 282 per kg in Yaounde instead of selling the paddy at FCFA 120 per kg in Lagdo. With an FRR of 18.6 percent (after the project grant), the group of farmers or operators implementing this milling units could significantly add value to the main product from the project and improve the price of paddy being paid to farmers in the project area. The second Rice Milling Model represents the case of a bigger unit with an investment of about US$140,000 with a 2,000 mt/year processing capacity as is the case of a milling unit operating in Garoua. In the case of this larger unit, the FRR would reach to 40 percent.

27. **The Onion Storage Model** was assumed to have a capacity for storing 100 mt of onions with which, after 2 to 4 months, could result in about 80 mt of off-season onion that could be sold at a price of around FCFA 320 per kg in Yaounde instead of FCFA 80 per kg if sold during the harvesting season in

[25] These drafted business plans, after the necessary feasibility studies, detailed designs and selection process could be supported and co-financed by the project's matching grants, covering about 30 to 60 percent of the investment, involving three to four strategic partners: (i) an association of farmers; (ii) an aggregator (processor, buyer, exporter, etc.); (iii) a financial institution (financing 30-40 percent of the investment); and (iv) an FSC providing technical support to the productive alliance.

[26] Rice is the seed or kernel of paddy, which is covered by two different layers, namely- bran (inner layer) and husk (outer layer). Paddy becomes rice only when the two layers are removed properly through different milling processes. In the first step, brown rice is extracted by removing hull/husk from the paddy, which contains a bran layer still intact around the kernel. In the second step, the bran layer is removed with a polishing machine that rubs the grains together under pressure, and the output is the polished white kernel or fine rice, which is ready for cooking. The former process is known as hulling, and the latter is known as milling of paddy. Generally, rice kernels are often susceptible to breakage due to inefficient milling processes as happens in the Lagdo area. A more efficient milling process will improve economic results as a better recovery ratio and *quality rice* kernel production is attained. It is one of the most important remedies for preventing post-harvest loss and an issue that is widely recognized around the world. More than 10 percent of the total production of rice is lost due to the use of traditional or outdated methods of drying and milling processes. The recovery ratio of whole grains in a traditional rice mill by using steel hullers for de-husking is about 52-54 percent. There is excessive loss in the form of coarse and broken grains. Generally, the loss of a large portion of *endosperm layers* is accentuated during the de-husking operation. Against it, the recovery ratio of whole grains in modern rice mills using rubber roll shellers for de-husking operation is around 62-64 percent.

the project area. The investment required was estimated at FCFA 6 million (US$10,000) for the required cool, dry, dark, and ventilated, rustic warehouse. In this case, it was assumed that 50 percent of the investment (FCFA 3 million, equivalent to US$5,000) would be provided as project grant. With an FRR of more than 100 percent (given that 50 percent of the investment would be covered with a grant), the individual or group of farmers implementing this unit could also significantly improve (lower) the onion price being paid in the area.

28. **Tomato, Papaya, Banana, and Passion Fruit/Mango Packing and Marketing Facility Models** were also assessed. These facilities are necessary for selling these perishable products in Yaounde and/or Nigeria with the required quality and presentation to access these markets. In these cases, the required investments would vary between FCFA 18 million (for papaya) and FCFA 60 million in case of passion fruit and mango that includes a juice production facility.[27] FRRs also vary from 46.8 percent for the passion and mango fruits packing facility to more than 80 percent in the other three cases, ensuring the marketing of these products in the targeted markets. Grants would be provided, covering 30 percent to 80 percent of investment according to the unit size and implementing entity (small farmer groups, big farmers and/or private entrepreneurs).

29. **Tilapia/Catfish Processing Model.** In this case, a processing unit to process tilapia (120 mt/year) and produce fish fillets with the required equipment and cold storage facilities would allow organizing around 300 women and youth groups with fish production ponds to sell cold or frozen fillets (60 mt all year round) to local and regional markets as can be seen in the following Table 3.5.[28]

[27] There is growing consumer interest internationally in general, and this implies an opportunity for Cameroon farmers. According to FAO, the international market for passion fruit is growing due to the consumer trend of seeking more and more exotic fruit varieties.

[28] During the past few years, growing interest has developed for aquaculture. It has been encouraged as a result of the training of young fish farmers by the Ministry responsible for aquaculture. Farmed fish is very popular with the people, but production is far too small to meet the ever-increasing demand. Fish is a high-value commodity, more capable of adding value to rural labor than any other farm crop. A kg of catfish is sold at 10 times the price of most agricultural commodities, such as staples cassava or maize.

Table 3.5: Fish Processing Association in Ladgo

Table 3.5 Fish Processing Association Lagdo						
FINANCIAL BUDGET (AGGREGATED)	**With Project**					
(In FCFA Million)	**1**	**2**	**3**	**4**	**5**	**6 to 20**
Main Production						
Tilapia Fillet	-	22.5	78.8	135.0	168.8	180.0
Fish Meal	-	3.8	13.1	22.5	28.1	30.0
Sub-total Main Production	-	26.3	91.9	157.5	196.9	210.0
Production Cost						
Investment						
Fish Processing Facilities	6.0	-	-	-	-	-
Cold Storage Facilities	4.0	-	-	-	-	-
Trucks	6.0	-	-	-	-	-
Working Capital	8.0	-	-	-	-	-
Sub-total Investment Costs	24.0	-	-	-	-	-
Operating						
Tilapia 350 gr	-	22.5	78.8	135.0	168.8	180.0
Other Inputs	-	0.0	0.0	0.0	0.0	0.0
Transport	-	0.4	0.4	0.5	0.6	0.6
Production Services	-	0.4	0.5	0.6	0.6	0.6
Labor	-	5.0	8.8	12.5	12.7	12.7
Sub-total Operating Costs	-	28.2	88.4	148.7	182.7	194.0
Sub-Total Production Cost	24.0	28.2	88.4	148.7	182.7	194.0
OUTFLOWS	24.0	28.2	88.4	148.7	182.7	194.0
Cash Flow Before Financing	-24.0	-2.0	3.5	8.8	14.2	16.0
Net Financing (see Financing Summary below)	**21.2**	**-8.7**	**-8.7**	**-6.1**	**-1.1**	**-**
Cash Flow After Financing	-2.8	-10.7	-5.3	2.7	13.0	16.0
Sub-Total Change in Net Worth	-2.4	-	-	-	-	-
Farm Family Benefits After Financing	-5.2	-10.7	-5.3	2.7	13.0	16.0
IRR = 38.8%, NPV = 56.2						
Main Production (in MT)						
Tilapia Fillet	-	7.5	26.25	45	56.25	60
Fish Meal	-	3.75	13.125	22.5	28.125	30
Purchased Inputs (in MT)						
Tilapia 350 gr	-	15	52.5	90	112.5	120
Financing Summary						
Grants	14.4	-	-	-	-	-
Contribution from own savings	2.4	-	-	-	-	-
Disbursements on Long Term Principal	7.2	-	-	-	-	-
Transfer from Previous Period	-	2.8	8.8	14.9	18.3	19.4
Total Inflows	24.0	2.8	8.8	14.9	18.3	19.4
Long Term Repayments	-	2.7	2.7	2.7	-	-
Transfer to Next Period	2.8	8.8	14.9	18.3	19.4	19.4
Total Outflows	2.8	11.5	17.6	21.0	19.4	19.4
Net Financing	**21.2**	**-8.7**	**-8.7**	**-6.1**	**-1.1**	**-**

30. The investment for the fish processing facility would be about FCFA 24 million (US$40,000) to be supported with a FCFA 14.4 million grant (US$24,000 or 60 percent of investment) and a Commercial Bank loan of FCFA 7.2 million (US$12,000 or 30 percent of investment costs). For this EFA, it was assumed that about 1,900 fish ponds would be established in about six locations in the right and LB perimeters, and one processing unit would be required in each location. The FRR of the farmers' group contribution to the processing unit investment would be 38.8 percent.

31. Table 3.6 provides a summary of the three production support services, and six post-harvesting processing and marketing models described in this section to exemplify the type of value chain development of the main products to be developed by the project TA and financial support instruments

(matching grants): rice, onion, tomato, banana, papaya, passion fruits, vegetables, and fish,[29] and is presented below.

Table 3.6: Post-harvesting Value Chain Development Models

Products (processing capacity)	Invest-ment	Project Grants	Gross Value Products	Net Value Value Products	FIRR %
	(in "000 FCFA)				
Large Machinery Service Provider (400 ha)	44,700	22,350	26,500	11,200	36.3
Small Land Preparation Service (40 ha)	3,780	3,000	1,200	552	51.1
Small Harvesting Service Provider (40 ha)	5,100	3,000	1,800	640	28.4
Rice Mill (360 MT/year)	3,750	3,000	28,365	8,555	53.4
Rice Mill (2,000 MT/year)	80,000	30,000	436,000	96,000	88.3
Onion Storage (100 MT)	6,000	3,000	5,120	2,420	>100
Tomato Packing (375 MT)	21,600	10,800	68,000	13,990	82.8
Banana Packing (765 MT)	32,600	16,300	156,400	45,660	86.5
Papaya Packing (540 MT)	18,000	9,000	105,600	39,840	>100
Passion Fr. Packing (4,650 MT)	60,000	30,000	184,700	75,300	46.8
Tilapia Processing (120 MT)	24,000	14,400	210,000	16,000	38.8

Aggregated Results

32. Once the typical farm and activity models were defined and adjusted, the aggregation of farm and activity models by subprojects, together with the overall project costs to be incurred by beneficiaries and the VIVA Benue project per each subproject (i.e. rehabilitation of existing perimeter; new areas for small farmers along the RB; the new areas for the small farmers and private sector along the LB; and all the support activities for developing the production and post-harvesting value chains, etc.), allows estimating the overall benefits to be captured by the different beneficiaries and Cameroon society. It also permits estimating the expected volumes of products to be produced, processed, and marketed, and the different inputs (including irrigation water) and labor involved in the overall project development activity.

33. Three subprojects are included in this EFA: (i) the rehabilitation of the existing perimeter being planted with rice (approximately 60 percent of the 2,180 small farms of half a ha in the about 1,090 ha of Phase I), and with other crops in approximately 400 ha; (ii) the development of the Phase II perimeter on the RB, involving about 7,600 small farmers on about 4,230 ha; and (iii) the expansion of the irrigated area along the LB (Phase III), assuming it would be assigned among 2,638 small farmers (in 1,320 ha) and 122 larger production units or farms of about 30 ha per farmer (on 3,660 ha, totaling about 4,980 ha to be irrigated on the LB). The aggregation of the three subprojects allows assessing the overall impact expected from the project.

34. The total project investments would be the equivalent to US$261 million (US$11.6 million under Phase I, US$103 million under Phase II, and US$146.4 million under Phase III). Investments would

[29] Fish from aquaculture is the cheapest source of animal protein that could be promoted in the project areas, both within the irrigation perimeters as complementary activity, and in the hotspots of the watershed as an alternative to unsustainable existing activities. Pond fish is considered by local health practitioners as superior to bush-meat, beef, pork, and poultry, and they recommend fish consumption especially for children, pregnant women, and the elderly. Capital to acquire basic inputs and high-quality seed (fingerlings) and good quality feed are necessary to push production above the minimum critical level. Socioeconomic and institutional factors, specifically those related to access to inputs (including knowledge) and market development (roads, market infrastructure, cold chains, population density and purchasing power) strongly influence aquaculture development as they require careful management and well-planned interventions.

be financed by IDA (US$200 million) and by beneficiaries (US$61 million), mainly with loans from commercial banks to be mobilized by the project matching grants. The aggregate gross and net values and costs of production, project investments, and resulting cash flow in economic values for each of the three project phases or subprojects were assessed. The following Table 3.7 summarizes the main parameters for the three subprojects and for the overall VIVA Benue project, including water being used and productivity of water expressed as net economic benefit generated per m^3 of irrigation water used.

35. Water productivity would increase from FCFA 7 per m^3 in the existing perimeter to FCFA 197 per m^3 for the overall project at maturity. Phases I and II would increase water productivity to FCFA 130 per m^3, while Phase III would reach to FCFA 293 per m^3 as rice would only be grown during the WS but not during the DS on LB where pressurized water will be used, and where the HVCs would be the prevailing crops.

36. Labor use would also be increased significantly by about 58 percent under the current requirements with the project investments. Labor use would grow from 3.6 to 5.7 million person-days of work at the project maturity. Returns per day worked would also grow significantly (at least by 100 percent) as can be seen in Tables 3.2 and 3.3.

Table 3.7: Main Indicators and Project Results per Subproject (Phase I, II and III) and for the Project

	Number of Farms	Area Total (ha)	Invest-ments (in Million	Water Use for Irrigation (MCM)	Value of Production at		Internal Rate of Return (%)		Net Present Value (6% discount rate)	
					Gross (USD	Net (USD Mi)	Financia	Economic	Financi al (USD	Economic (USD Mi)
Phase I	2,180	1,090	11.6	16.1	9.3	4.3	35.4	22.4	14.3	12.5
Phase II	7,790	4,230	103.0	66.0	36.0	15.8	8.9	9.0	16.2	17.3
Phase III	3,114	5,121	146.4	57.9	47.5	24.4	39.1	14.4	125.5	70.6
Total	13,084	10,441	261	140.0	92.8	44.5	21.7	12.6	156.0	100.4

37. The detailed economic costs and benefits of the project were calculated. Table 3.8 below shows the incorporation of beneficiaries considered for this EFA, including farmers, supported production service providers, and the post-harvesting activities as the project implementation proceeds. The overall result would be fully justified as it shows an ERR of 12.6 percent and an NPV (with 6 percent as discount rate) of FCFA 60.2 billion (equivalent to US$100.4 million). CFs for labor (0.7) and for the investment costs (0.8385) were used, considering the low opportunity cost of family labor in the project area, and the value added taxes (VAT) that the project will pay over the investments for rehabilitating and expanding the irrigation infrastructure. No other price was adjusted for the economic analysis.

Table 3.8: Aggregation of Beneficiaries (Farmers and Activities Supported by the Project)

	Project Year					
Participating Farm or Activity Units	1	2	3	4	5	6
Farm Model 1: Irrigated in Existing Lagdo Perimeter (0.5 ha) with Upland parcels (1.5 ha)		200.	670.	1,200.	1,200.	1,200.
Farm Model 3: Irrigated in Existing Lagdo Perimeter (0.5 ha) with Upland (1.5 ha)		100.	400.	580.	580.	580.
Farm Model 2: Irrigated in Existing Lagdo Perimeter (0.5 ha) with rainfed parcels (1.5 ha) adding a 300m2 fis		100	300	650	2150	3038
Farm Model 4: New Irrigated Farm in Lagdo Right Bank Perimeter (0.5 ha with rice) with Upland parcels (1.5 ha)				650.	3,350.	7,000.
Farm Model 5: New Irrigated Farm in Lagdo II Right Bank (1.25 ha) with Banana (0.75 ha), Onions (0.75 ha) & rainfed parcels (1.5				25.	137.	330.
Farm Model 6: New Irrigated Farm in Right Bank (3 ha) with Papaya (1.5 ha) and Tomato in DS & Watermelon in WS (1.5 ha). Upl				200.	500.	106.
Farm Model 7: New Irrigated Farm outside the Perimeters (0.5 ha with rice in WS and Onion in DS) with Upland parcels (1.5 ha)				200.	480.	708.
Tilapia Model (Women and Youth landless) Supported with a 300 m2 pond	-	150.	450.	1,050.	1,500.	1,500.	1,500.
Farm Model III-1 Irrigated 30 ha in Left Bank (Watermelon in DS; & Rice in WS			-	-	4.	10.	15.
Farm Model III-2 Irrigated 30 ha in Left Bank (Onions in DS; Rice in WS)			-	-	8.	19.	29.
Farm Model III-3 Irrigated 30 ha in Left Bank (Tomato in DS; Rice in WS			-	-	4.	10.	15.
Farm Model III-4 Irrigated 30 ha in Left Bank (Banana developed in 3 years)			-	-	6.	14.	22.
Farm Model III-5 Irrigated 30 ha in Left Bank (Papaya developed in 2 years)			-	-	5.	12.	19.
Farm Model III-6 Irrigated 30 ha in Left Bank (Passion Fruit and Mango developed in 2 years)			-	-	6.	14.	22.
Rice Milling Unit (360 ton capacity per year)	-	-	6.	13.	30.	45.	45.
Rice Milling Group (2,000 ton capacity/year)	-	-	-	-	2.	6.	6.
Onion Storage Facility	-	-	-	15.	110.	685.	1,255.
Tomato Packing Facility	-	-	-	5.	10.	14.	14.
Banana Packing Facility	-	-	1.	3.	6.	6.	6.
Papaya Packing Facility	-	-	-	-	1.	2.	4.
Fish Processing Association Lagdo	-	-	1	-	2.	4.	6.
Machinery Service Provider (Tractors, land preparation, harvesting, etc.)	-	-	-	4.	10.	21.	39.
Machinery Small Service Provider (Motoculture for land preparation)	-	-	8.	23.	46.	104.	130.
Machinery Small Service Provider (Harvesting and Treshing)	-	-	8.	23.	46.	104.	130.

38. **GHG Assessment.** A GHG assessment, using conservative boundary values, has been performed for this project, using the FAO's EX-ACT. The results show that the project would create a total net carbon sequestration of -301,549 tCO_2-eq across the project's economic lifetime, with average annual net emissions of -15,078 tCO_2-eq and economic lifetime gross emissions of 400,309 tCO_2-eq. The reduced emissions would result from the project's contribution in promoting CSA production systems during the 7-year implementation period by financing investments and TA for the adoption of SRI and other environmentally friendly technologies for rice and other crops. The GHG estimated accounting totals are detailed in Table 3.9: Phases I and II would lead to net emission reductions, while Phase III would be slightly net emissive due to the expansion of fertilizer use. However, the overall balance for the project show that net emission reductions will prevail. The use of a shadow price of carbon in the economic analysis of projects is a World Bank corporate commitment for all IBRD/IDA investment project financing that are subject to GHG accounting.[30]

[30] GHG emissions are global externalities. As such, it is recommended that the scenarios considered in the economic analysis be done both with and without the shadow price of carbon. The analysis with the shadow price of carbon reflects the global impacts of a project, shared with other countries, while the analysis without the shadow price of carbon conveys the impacts of the project without considering climate change.

Table 3.9: Gross and Net Emissions Expected from the Project

Phase	Net Emissions (Economic Lifetime) tCO2-eq	Net Emissions (Average Annual) tCO2-eq/year	Gross Emissions (Economic Lifetime) tCO2-eq	Gross Emissions (Average Annual) tCO2-eq/year
Phase I	-95,073	-4,754	263,211	13,161
Phase II	-245,544	-12,277	98,030	4,901
Phase III	39,068	1,953	39,068	1,953
Totals	**-301,549**	**-15,078**	**400,309**	**20,015**

39. In line with the guidelines of the World Bank and the High-Level Commission on Carbon Prices, this economic analysis used a low and high estimate of the carbon price, starting at US$40 and US$80, respectively, in 2020 and increasing to US$50 and US$100 by 2030.[31] To incorporate the carbon externalities into the economic analysis, the annual shadow price of carbon (US$/tCO2e) was multiplied by the annual GHG emissions reductions (tCO_2e) over the economic lifetime of the project. The calculations were done using the template for applying the Shadow Price of Carbon. By adding the GHG emission mitigation, the ERR of the project increases from the estimated 12.6 percent to 14 and 14.6 percent when using the low and high shadow price of carbon, respectively.

Sensitivity Analysis

40. As sensitivity of the project results in major implementation risks, the ERR was re-estimated under the following adverse scenarios: (i) all agricultural prices reduced by 10 percent; (ii) investment cost increases by 10, 20, and 30 percent; (iii) no post-harvest value addition for rice and onions; and (iv) a general agricultural prices drop by 10 percent together with a general investment costs increase by 10 percent. The following Table 3.10 shows that, in all cases, the ERR would remain above 8.8 percent which allows one to conclude that the expected results are robust against major risks.

Table 3.10: Sensitivity Analysis

	ERR	(in Mill FCFA)	(in Mill USD)
Base Case Scenario	**12.6%**	**60,242**	**100.4**
All Agricultural Products Price down by 10%	9.9%	33,702	56.2
All Investment Costs up 10%	11.2%	50,391	84.0
All Investment Costs up 20%	9.9%	40,539	67.6
All Investment Costs up 30%	8.8%	30,688	51.1
No Rice Milling, Onion Storage & Packing Activities	10.2%	34,792	58.0
Product Prices down 10% and Invesrment Costs up 10%	8.8%	23,851	39.8

[31] Given that the High-Level Commission report does not prescribe any specific carbon price values beyond 2030, the low and high values on carbon prices were extrapolated from 2030 to 2034 using the same growth rate of 2.25 percent per year that is implicit between the 2020 and 2030, leading to values of US$54.7 and US$109.3 by 2034.

ANNEX 4: Land Tenure Issues

1. Cameroon's land legislation[32] establishes four categories of land: (a) private land; (b) national land which is held on behalf of the nation and where customary land tenure applies; (c) land in the public domain of the State; and (d) land in the private domain of the State.[33] In Northern Cameroon, the traditional authorities (the *Lamido* or chiefs) play a key role in the management of national land, a role that is formally recognized in the legislation (particularly as regards local tax collection).

2. The project envisages: (a) the rehabilitation/completion of infrastructure to irrigate 1,090 ha of land on the RB below the Lagdo Dam as well as the construction of new irrigation infrastructure to irrigate 4,230 ha of land, for small-scale farmers (hereafter the RBIS); and (b) the construction on the LB of new infrastructure to irrigate: (i) 3,628 ha of land to be used by larger commercial farmers; and (ii) 1,496 ha of land to be used by small-scale farmers (hereafter the left bank irrigation scheme or LBIS).

3. The process of developing the RBIS began in 1987 on an initial 200 ha (using GoC funding), with a further 90 ha developed in 1989 (with EU funding) and another 800 ha between 1992-93 (with Chinese funding) of which only 400 ha was completed. The result is that only around 600 ha of land, allocated to some 1,200 families, is now irrigated.

4. In the early 2000s, a private operator (the *Société Agro Industrielle de la Bénoué* – SAIB) requested an emphyteutic lease to develop 2,400 ha of land for commercial crop production. Although that project was subsequently dropped, due to local protests, the formal process of transferring the land necessary for the RBIS and LBIS into the private domain of the State began with declarations of public utility, the first step in the expropriation process, being issued in 2001 and 2008.

5. Subsequently the land for both the RBIS and the LBIS was expropriated through conversion from national land into land of the private domain of the State in 2010[34] and the new boundaries were subsequently demarcated.

6. The current situation, therefore, is that 10,267 ha of land for the RBIS and LBIS lies within the private domain of the State, while a further 177 ha of land that can be served by the LBIS remains with the status of national land (with individual land plots being held on the basis of customary land tenure rights).

7. Following a process of inventorying and valuation, monetary compensation was paid with respect to the expropriated land in the RBIS and LBIS in accordance with the applicable legislation[35] (296,789,000 CFA francs were paid to the affected people).[36] Moreover, in the RBIS, a resettlement area was identified 5-10 kilometers away, comprising 500 ha for housing plots with access to basic services (schools, health, electricity, and water) as well as 5,000 ha for rainfed agriculture and 5,000 ha for pastoral activities. However, the resettlement process has not yet begun, and the affected people continue to occupy and exploit agriculture land that now lies within the private domain of the State. Moreover, given that it is now

[32] Ordinance No. 74-1 of 6 July 1974 on land tenure.
[33] Ordinance No. 74-2 of 6 July 1974 on the land of the domanial regime.
[34] Decrees 2010/3443 / PM, 2010/3444 / PM, relating to the incorporation into the private domain of the State of dependence of the national land and 2010/3445 / PM of December 15, 2010 relating to compensation victims of property destruction during the incorporation into the private domain of the State of land located downstream of the Lagdo Electric Dam, Department of Benue.
[35] Law No. 80-21 of 14 July 1980 to amend certain provisions of ordinance No. 74-1 of July 1974 to establish rules governing land tenure and Instruction n°005/I/Y.25/MINDAF/D220 of 29 December 2005 to recall the basic rules about the implementation of the system of expropriation for public purposes.
[36] Decree 2010/3445 / PM of December 15, 2010 providing compensation to people victims of destruction of property during the incorporation work in the private domain of the State of land located downstream of the Lagdo electric dam, Benoué Department.

foreseen that the RBIS will provide irrigation for small-scale farming, the need for relocation is less obvious, given that the affected people will prefer to remain living near to the irrigated land areas.

8. On the 600 ha of land in the RBIS that is currently irrigated, land plots of 0.5 ha per family are held on the basis of indefinite use rights in accordance with individual land allocation certificates validated by the traditional authorities.

9. All these issues were identified during the project preparation visits in 2017-2018. The ToR for a social assessment of these issues were prepared by the Client and cleared by the World Bank. The social assessment was carried out in 2019 and involved extensive social consultation. The final social assessment report was cleared by the World Bank on February 10, 2020. The results showed that the process undertaken by the Government was in accordance with the World Bank's safeguard policies and that the risks can be managed with the TA of the project under Subcomponent 1.3.

10. While the land within the LBIS and RBIS will remain within the private domain of the State, the TA under Subcomponent 1.3 will provide an opportunity to clarify and strengthen land tenure rights. On the basis of a transparent process, land use agreements containing substantive conditions, will be used to specify the rights and duties of both MEADEN and the farmers, including their respective obligations with regard to WUAs in particular and irrigation management in general. Specific land allocation processes will be set up for smallholders (right and LB) and large landholders on the LB. The TA will further investigate existing legal documentation regarding land governance (land registration and land tenure right recognition) and will deal with both the land allocation process (identifying allocation criteria) and the updating of land use agreements (land tenure rights clarification and enhancement within the irrigation scheme).

11. With regards to the land allocation process, eligibility criteria for (re-)settlement in the rehabilitated and new irrigation schemes could be: the presence on the list of current farmers of parcels, the presence on the list of persons enumerated in 2019 to appear on the list of the big farmers of Gounougou, and the presence on the list of women members of cooperatives active in the perimeters. To avoid conflict with the rights and duties of the existing users of irrigated land within the RBIS will be reviewed and revised appropriate: both the Government and local government authorities have agreed in principle that these users may remain on the land once the infrastructure has been rehabilitated/completed, provided they are subject to the same common regime in term of rights and duties as newly settled land users in the rest of RBIS. In addition, the 70 percent of the inhabitants bordering the existing 600 ha irrigation scheme, having not yet received parcels, will have priority in the distribution of the 400-ha extension, plus the new 4,230 ha.

12. The TA will also ensure that land tenure rights are properly recorded. Since the issue of access to land for young people and women is a major challenge,[37] the TA will provide specific recommendations on this aspect. One land issue risk could stem from the lack of transparency or misunderstanding about the process of land management and land contract update in the irrigation scheme. But, based on experiences in similar contexts in other Sahelian countries, including projects supported by the World Bank, a key mitigation measure is to make all land rights management as transparent as possible, with clear communication with beneficiaries, affected persons, and all the stakeholders involved.

[37] Women and young people are mostly excluded from local governance structures.

13. Similar processes are in place in public irrigation schemes in similar contexts such as in Niger, Senegal, Burkina Faso, and Mali. The project could learn from these experiences in compliance with the legal framework in Cameroon. Regarding the water fee, an assessment of the acceptable amount is necessary as well as of the payment terms. Also, the conditions of forfeiture of the land use rights should be specified to incentivize the various actors to seek an optimum functioning of the perimeters. This could be through the inclusion of appropriate conditions in the land use agreements which will take into account new stakeholders (such as WUAs) and new land and technical management.

14. The TA will also make recommendations as to the term (duration) and substance of the land use agreements to be concluded with the larger commercial farms on the LBIS.

15. The legal support to be provided under the TA will develop the land use agreements to be used for the small-scale farmers as well as the larger commercial farmers on the basis of extensive consultation.

ANNEX 5: The Legal Basis for Water User Associations Establishment

1. The basic challenge for the project is the lack of an appropriate legal framework for water user associations (WUAs). A key legal requirement for effective WUAs is that membership in a WUA has to be compulsory. A WUA is not like a cooperative or an NGO where membership implies the right to join or leave at any time. Every person who holds land within the service area of a WUA must automatically be a member of that WUA. As such, a WUA member is subject to the rules of the WUA as regards water management and also subject to the duty to pay the water fee to enable the WUA to cover its costs of operating and maintaining irrigation infrastructure through which water is supplied within its service area. The rights and duties which relate to WUA membership are not personal to the landholder but attached to the land plots within the service area.

2. Cameroon has little experience of WUAs and therefore unsurprisingly has no WUA legislation in place. Moreover, the existing law on NGOs/associations is called the 'Law on Freedom of Association' and as such embraces the right to join or leave an association at will. It is of course possible to set up associations on the basis of that law and to call them 'WUAs'. Such an approach is currently being piloted under PULCI. However, any future WUA member has the right to leave at any time, and if this happens there is nothing the 'WUAs' can do to prevent that.

3. The 'ideal' solution would be the preparation and adoption of specific legislation on the irrigation sector that could set out the clear and robust governance structures that WUAs require (there can often be disputes over water allocation) and set out a clear legal basis for the transfer to WUAs of the right to manage and use public irrigation infrastructure. However, there is a clear risk that the adoption of WUA legislation could take many years to complete, most likely after the end of the project.

4. The existing water law is silent on WUAs and does not create a clear legal basis for the adoption of interim subordinate legislation in the form of a ministerial decree/decision. Therefore, a range of different interim solutions will need to be found. In terms of a long term-solution, the ongoing preparation of a new National Water Policy, Hydro-Agricultural Policy, and Water Code seems to offer the best opening. Under this approach, the first step will be to ensure that suitable high-level wording is included in the draft National Water Policy that opens the way to WUA formation. The draft policy was recently subject to a 'validation workshop' during the course of which: (a) it was agreed that the layout and approach of the document was not appropriate and that it would need to be altered to comply with the required format; and (b) that additional policy directions and strategic objectives should be included. Among the strategic objectives agreed at the workshop were: (i) 'Promote the development of a private sector ready to invest in supporting the development of the agricultural services market;' and (ii) 'Complement and improve the institutional, legislative, and regulatory framework to integrate local actors in the management and sustainability of hydraulic and hydro-agricultural infrastructure'. This wording was proposed by a representative of PULCI and would seem to form an appropriate high-level basis for the future development of WUA legislation.

5. Although the Ministry of Water and Energy agreed to revise the draft policy, it has in the past complained about a lack of resources.

6. Once the draft National Water Policy is submitted to the Government for approval (there is no need to wait for the actual approval to be given), the next step will be to work with MINADER on revising and finalising the Draft Hydro-Agriculture Policy. This is a substantive document that already contains a number of references to WUAs. It will, however, be appropriate to develop the wording on WUAs in

particular as regards the issue of compulsory membership and the fact that the rights and duties of membership apply to the land plot not the individual land holder.

7. In the meantime, it will be appropriate to either support the Ministry of Water and Energy as they prepare a second draft of the Water Code or at the very least to contribute to that process to ensure that appropriate wording on WUAs is included in the text. Such wording need not be extensive. It will be enough to state the basic requirements along the lines that WUAs should be established on public irrigation schemes to take responsibility for management, operation and maintenance, that the membership is compulsory with the rights and duties of membership applying to the land plots in question, and that more detail with regard to the establishment and functioning of WUAs, including with regard to legal/financial supervision, is to be set out in regulations. Ideally, such regulations would be in the form a joint decision/decree adopted by the Minister of Water and Energy and the Minister of Agriculture and Rural Development. It would be appropriate to prepare a draft text of such a decision contemporaneously with the development of the draft Water Code. The challenge is that due to its cross-cutting nature and the number of ministries and sectors that will be involved, the preparation of the Water Code may be a lengthy process. Moreover, even if the Government adopts the draft Water Code prior to transmission to the National Assembly, the latter may take some time to adopt the text.

8. An alternative and possibly quicker approach, once the Hydro-Agriculture Policy is adopted, may be to assist the Ministry of Agriculture to prepare a separate irrigation law that could explicitly address the issue of WUA formation and operation and the transfer in use of infrastructure to WUAs. While such a law should be quicker to developer, given that fewer ministries will be involved in the process, the date of its final adoption would again depend on the time table of the National Assembly.

9. A further option that has been suggested is that the Minister of Agriculture could adopt a draft decision on WUAs. There are two problems with this approach. The first is that a minister does not have plenary legislative power. S/he can only adopt subordinate legislation if an existing law confers the necessary legal power to do so. Unfortunately, there is no such law. Moreover, from a legal perspective, there is no question that a Ministerial decision could be used to create WUAs as a new type of legal entity or legal person. From a legal perspective the creation of a new type of legal person is a complex issue, a matter that requires a clear basis in law. At the same time, if the Minister were to seek to adopt a decision that modifies the existing legislation by requiring compulsory membership in associations that are themselves formed on the basis of a law that explicitly excludes the possibility of compulsory membership (even in its name), there would be an obvious contradiction and possible legal and political backlash.

10. A robust interim solution is therefore proposed. First of all, the agreements for the use of land plots within the irrigation scheme to be concluded with both small scale and commercial farmers will require the latter to pay their water fees through the WUA, to comply with the rules of the WUA and to participate in the WUA.

11. Next an interim legal framework for the irrigation scheme will be prepared in the form of a Decision of the Minister of Agriculture and Rural Development (MINADER) approving the management rules for public irrigation schemes in the Adamawa, North and Far-North regions. This will be followed by the development of a ‘scheme management code’ that will set out the basic rules as to how: (a) the WUAs are to function; (b) legal/financial oversight of WUAs is to be undertaken by a specific unit within MEADEN; (c) infrastructure is to be transferred to the WUAs in use on the basis of long-term use agreements following a step by step basis and a period of co-management; (d) disputes are to be resolved; and (e) water is to be supplied in bulk by MEADEN to each WUA. In other words, as a temporary measure pending the adoption

of the relevant legislation, the aim of the scheme management code is to be fill in the legislative 'gap' that currently exists in a manner that is as robust, clear and transparent as possible.

12. The simple fact is that experience from donor-funded projects around the world is that it is always possible to set up some form of 'WUA' that seems to work perfectly well while the project is being implemented, and which fail once the project ends. The challenge is to have a sufficiently clear and robust legal framework, that does not require legal chicanery or wishful thinking, that can outlast the project and result in sustainable WUAs. Experience suggests that this is usually only possible with explicit legislation; hence the need to support the development of appropriate provisions in the new Water Code or a separate irrigation law followed up the necessary subordinate legislation.

ANNEX 6: Development Policy Letter

REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie

MINISTÈRE DE L'ECONOMIE, DE LA PLANIFICATION ET DE L'AMENAGEMENT DU TERRITOIRE

SECRÉTARIAT GÉNÉRAL

DIRECTION GENERALE DE LA COOPERATION ET DE L'INTEGRATION REGIONALE

DIRECTION DE LA COOPERATION NORD-SUD ET DES ORGANISATIONS MULTILATERALES

SOUS-DIRECTION DE LA COOPERATION MULTILATERALE

REPUBLIC OF CAMEROON
Peace - Work - Fatherland

MINISTRY OF ECONOMY, PLANNING AND REGIONAL DEVELOPMENT

SECRETARIAT GENERAL

GENERAL DEPARTMENT OF COOPERATION AND REGIONAL INTEGRATION

NORTH-SOUTH AND MULTILATERAL COOPERATION DEPARTMENT

SUB-DEPARTEMENT OF MULTILATERAL COOPERATION

N° 00000170 2 /L/MINEPAT/SG/DGCOOP/DNS/M/IE3

Yaoundé, le 21 AVR 2020

LE MINISTRE,

A Monsieur le Directeur des Opérations pour le Cameroun, Région Afrique de la Banque Mondiale
- Yaoundé –

Objet : **Coopération Cameroun/Banque Mondiale**
Mise en œuvre des recommandations de la mission d'évaluation du Projet d'Aménagement et de Valorisation des Investissements de la Vallée de la Bénoué (VIVA-Bénoué) et d'appui à la préparation du Projet d'Aménagement et de Valorisation des Investissements de la Vallée du Logone (VIVA-Logone) du 17 au 28 février 2020

Monsieur le Directeur des Opérations,

En me référant aux conclusions de la mission visée en objet,

J'ai l'honneur de vous faire tenir ci-joint la note d'engagement du Gouvernement signée par mes soins au sujet de la mise en œuvre des deux projets susmentionnés (VIVA-Bénoué et VIVA-Logone).

En effet, comme convenu avec la Banque mondiale, le Gouvernement du Cameroun s'engage dans le cadre de ces deux projets à :

1. transférer la gestion des périmètres réhabilités et/ou aménagés aux Associations des Usagers de l'Eau (AUE) suivant des modalités à définir en matière de gestion de l'eau et du réseau d'irrigation ;
2. impliquer progressivement le secteur privé dans le financement des plans d'affaires pour la mise en œuvre de certaines activités telles que le labour, le planage mécanisé, les intrants agricoles et, l'appui conseil ;
3. promouvoir la dynamisation de l'offre des services de transformation et de commercialisation par le secteur privé à travers notamment le financement des plans d'affaires ;
4. assurer la régulation du secteur de l'hydraulique agricole.

Par ailleurs, le Gouvernement a déjà engagé et va poursuivre la finalisation de la Politique Nationale de l'Eau (PNE) qui intègre notamment le statut juridique des AUE.

Vous réitérant la gratitude du Gouvernement pour le soutien de votre institution aux efforts de développement du Cameroun, je vous prie d'agréer, Monsieur le Directeur des Opérations, l'assurance de ma considération distinguée./-

PJ : -Note d'engagement

COPIE: - SG/PM
- MINEE
- MINADER
- SEMRY
- MEADEN

REPUBLIQUE DU CAMEROUN Republic of Cameroon
LE MINISTRE
MINISTERE DE L'ECONOMIE DE LA PLANIFICATION ET DE L'AMENAGEMENT DU TERRITOIRE

Alamine Ousmane Mey

Translation of Development Policy Letter

April 21st, 2020
Country Director
Africa region of the World Bank
- Yaounde -

Subject: Cooperation Cameroon/World Bank

Implementation of recommendations of the appraisal mission for the Valorization of Investments in the Valley of the Benue Project (VIVA-Bénoué) and the support for the preparation of the Valorization of Investments in the Valley of the Logone Project (VIVA-Logone) from February 17 to 28, 2020

Dear Sir,
Following the conclusions of the mission in the subject line, I am honored to provide herewith the signed Government's commitment note regarding the implementation of the two mentioned projects (VIVA-Bénoué and VIVA-Logone).

Indeed, as agreed with the World Bank, the Government of Cameroon undertakes, within the framework of these two projects to:

1. Transfer the management of rehabilitated and/or developed perimeters to the of Water Users Associations (WUA), following the conditions to be defined in terms of water and irrigation network management;
2. Gradually involve the private sector in the financing of business plans for the implementation of certain activities such as plowing, mechanized leveling, agricultural inputs and advisory support;
3. Promote the revitalization of the supply of processing and marketing services by the private sector, in particular through the financing of business plans;
4. Ensure the regulation of the agricultural hydraulic sector.

In addition, the Government has already initiated and will continue to finalize the National Water Policy (NWP) which notably incorporates the legal status of WUA.

While reiterating the gratitude of the Government for the support of your institution for Cameroon's developments efforts, please accept Mr. Country Director the assurance of my highest consideration.

Attached: Engagement note

Signed by Mr. Alamine Ousmane May, Minister, Ministry of Economy, Planning and Regional Development

Copy: - SG/PM
- MINEE
- MINADER
- SEMRY
- MEADEN

ANNEX 7: Dam Safety Aspects of the Lagdo Dam

1. The Lagdo multipurpose dam is located on the Benue river about 70 km from the city of Garoua. The plant, built by a Chinese contractor between 1978 and 1982, includes the following main structures (see Figure 7.1):

- A 40 m high and 308 m long earthfill dam with a clay central core;
- A headrace channel excavated in rock and concrete lined;
- A gated spillway with two 1,200 m^3/s bays and downstream stilling basin and tailrace channel; the spillway structure also integrates the water intake to feed the irrigation supply system on the LB of the river Benue;
- An 800 m^3/s diversion tunnel transformed in a bottom outlet after completion of the project in the 1980s;
- An intake structure with four inlet structures and penstock to feed the powerhouse;
- A powerhouse equipped with four 18 MW Kaplan units with a net head between 16 m and 26 m;
- A substation with three 110 kV and two 30 kV transmission lines;
- Two saddle dams (not visible in the picture) East: 13.9 m high and 672 m long earthfill dam and West: 6.7 m high and 1,175 m long earthfill dam; and
- An agriculture water intake located on the West saddle dam to feed agriculture fields on the RB of the river Benue.

Figure 7.1: General view of Lagdo earthfill dam and appurtenant facilities (headrace channel, spillway, water intake, and powerhouse).

2. The dam impounds a reservoir with a gross capacity of 7,700 hm^3 at Full Supply Level (FSL=El. 216.00) and the dead volume under El. 206.00 is 800 hm^3. The maximum reservoir level during extreme flood is El. 218.18. The reservoir drains the water of a 31,000 km^2 catchment area with average annual inflow of 7,850 hm^3, which corresponds to an average discharge of 248 m^3/s.

3. The dam monitoring equipment, in operation since the dam impoundment, is as follows:

- 46 geodetic monuments; and
- 18 piezometers.

4. The appurtenant structures (saddle dams, headrace channel, water intake, and spillway) are also equipped with some monitoring instruments to control the structure's performance.

5. The dam is owned by the GoC (MEADEN), with ENEO operating under an umbrella contract for energy generation and distribution throughout the country.

6. ENEO operates and maintains the plant in a satisfactory manner according to GIIP with a staff responsible for regular surveillance and maintenance.

7. A dam safety management system is in place, which includes the following:

(a) **Documents management system**: there is a permanent record of the design and construction (document mainly in Chinese) but also the operation and performance of the dam and appurtenant structures;

(b) **Surveillance plan**: regular inspection and monitoring data allow to confirm satisfactory performance of the 40-year old structures;

(c) **O&M plan**: ENEO undertakes regular maintenance to ensure both availability and safe operation of the dam and its appurtenant structures; and

(d) **Emergency Preparedness Plan (EPP)**: An EPP is operational with a warning system in place.

8. A World Bank Dam Specialist visited the dam on June 17, 2019. The main findings of this visit are as follows:

- The dam and its appurtenant structures age normally. There is no evidence of problems or deficiency susceptible to affect its long-term safety;
- ENEO operates and maintains the works and equipment in a satisfactory manner and in line with GIIP;
- The hydromechanical equipment, in particular the spillway gate hoisting system, needs to be rehabilitated to ensure long term operational reliability and safety;
- The monitoring system needs to be rehabilitated and updated, taking into account recent technological developments and GIIP;
- Reservoir sedimentation could be an issue but incoherence between bathymetric surveys does not allow to draw reliable conclusions in this regard. Further investigations are needed; and
- The dam safety plan will be updated in the context of the project, with World Bank support.

9. As required by OP 4.37, MEADEN hired an independent dam safety specialist with the purpose to:

(a) Inspect and evaluate the safety status of the existing dams, their appurtenances, and their performance history;

(b) Review and evaluate the owner's operation and maintenance procedures (e.g. Operation and Maintenance [O&M], Instrumentation Plan and EPP); and

(c) Provide written reports of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam to an acceptable safety standard.

10. The independent dam safety specialist has already prepared a dam safety review inception report and a dam safety assessment report based on several site visits and meetings/interviews with ENEO representatives and the staff in charge of O&M.

11. The dam safety assessment report was submitted to the World Bank in draft version at the end of January 2020. The latter confirms the general good conditions and performance of the 40-year old structures. The plant is well operated and maintained and also monitored satisfactorily with the installed instrument.

12. The main recommendations of the dam specialist to ensure acceptable dam safety conditions according to GIIP include the following:

(a) Reviewing and updating the hydrology study which will probably lead to the need to increase the discharge capacity of the dam. This could be reached through the installation of fuse gates on the west saddle dam;

(b) Rehabilitating the 40-year old spillway gates hoisting system;

(c) Rehabilitating and upgrading the dam monitoring equipment, including capacity building and training of the staff in charge of the O&M of the dam;

(d) Inspecting and repairing, if justified for operation or safety reasons, both penstocks and bottom outlet tunnel. It was not possible to inspect these structures during the specialist’s visit;

(e) Implementing other minor maintenance works to ensure the long-term integrity and safe operation of the dam and its appurtenant structures; and

(f) Reviewing and updating the dam safety plans (O&M Plan, Instrumentation Plan, and EPP) according to GIIP and taking into account recent technological developments.

13. The project will include the implementation of safety-related constructive and non-constructive measures necessary to upgrade the Lagdo dam to an acceptable standard of safety and to insure a safe and reliable operation of the plat. In this context, and according to World Bank dam safety policy, an independent dam safety panel will assist ENEO in the implementation of the related dam safety measures. This panel will consist of a hydrology and hydraulics specialist, a dam monitoring specialist, and a hydromechanical equipment specialist.

ANNEX 8: Sequencing Table for VIVA Benue

Preparation (2019- 2020)	Year 1 (2021)	Year 2 (2022)	Year 3 (2023)	Year 4 (2024)	Year 5 (2025)	Year 6 (2026)	Year 7 (2027)
1 – Improvement of Infrastructure and Water Management							
Ongoing studies: RB and LB hydro-agricultural development, preliminary project documents, and tender documents	Finalization of development studies for RB perimeters 1,000 + 5,000 ha	Procurement process for phase 1 and phase 2 works and works oversight	Rehabilitation works for (phase 1) 1,000 ha open canal; Development (phase 2) 1,000 Ha new RB open canal	Development work (phase 2) 2,000 ha RB open canal	Development work (phase 2) 2,000 ha RB open canal	Finalization of development works phase 2	
			Construction work oversight	Construction work oversight	Construction work oversight	Construction work oversight	
	Finalization of development studies for perimeters on the LB 5,000 ha (pressure irrigation) and RB and LB protective dikes	Procurement process for phase 3 and control works (same as phases 1 and 2) and for the construction of the RB and LB protection dikes	Development work on the LB area (phase 3): Installation of primary pipes	Installation work (phase 3) of secondary and tertiary pipes + water meters	Installation work (phase 3) of secondary and tertiary pipes + water meters		
			Construction work oversight	Construction work oversight	Construction work oversight		
			Construction of protective dikes for RB & LB	Construction of protective dikes for RB & LB	Finalization / revegetation of protective dikes for RB & LB		
		Work on banks, canals and roads (revegetation, mowing, etc.)	Work on banks, canals and roads (revegetation, mowing, etc.)	Work on banks, canals and roads (revegetation, mowing, etc.)	Work on banks, canals and roads (revegetation, mowing, etc.)	Work on banks, canals and roads (revegetation, mowing, etc.)	Work on banks, canals and roads

<table>
<tr><th>Preparation (2019- 2020)</th><th>Year 1 (2021)</th><th>Year 2 (2022)</th><th>Year 3 (2023)</th><th>Year 4 (2024)</th><th>Year 5 (2025)</th><th>Year 6 (2026)</th><th>Year 7 (2027)</th></tr>
<tr><td rowspan="4">Land management/ development of award criteria; Census of rice farmers; Establishment of the plot allocation committee (RB and LB)</td><td rowspan="3">Implementation of the GIS; Updating of specifications; Registration of plot requests/updating of the register of beneficiaries</td><td>Updating the register of beneficiaries</td><td>Allocation of new plots in RB and LB</td><td>Allocation of new plots in RB and LB</td><td>Allocation of new plots in RB and LB</td><td rowspan="2">Operation of the rice and agricultural plot management system</td><td rowspan="2">Operation of the rice and agricultural plot management system</td></tr>
<tr><td>Allocation of new plots in RB</td><td rowspan="2">Raising awareness/training rice farmers on land management</td><td rowspan="2">Raising awareness/training rice farmers on land management</td><td rowspan="2">Raising awareness/ training rice farmers on land management</td></tr>
<tr><td>Raising awareness/training rice farmers on land management</td></tr>
<tr><td rowspan="2">Support for the structuring of associations of water users (creation, training, support, equipment, etc.)</td><td rowspan="2">Support for the structuring of WUAs (creation, training, support, equipment, etc.)</td><td>Support for the structuring of WUAs (creation, training, support, equipment, etc.)</td><td>Support for the structuring of WUAs (creation, training, support, equipment, etc.)</td><td>Support for the structuring of WUAs (creation, training, support, equipment, etc.)</td><td>Operation of WUAs</td><td>Operation of WUAs</td></tr>
<tr><td>Exchanges with SAED</td><td>Exchanges with SAED</td><td>Exchanges with SAED</td></tr>
<tr><td></td><td>Management of subsidy systems with CGER</td><td>Management of subsidy systems with CGER</td><td>Management of subsidy systems with CGER</td><td>Subsidy systems management/CGER</td><td></td><td></td></tr>
<tr><td colspan="8">2 – Production and Support to Agriculture Services</td></tr>
<tr><td rowspan="2">Studies in progress/CGER Identification of local actors</td><td rowspan="2">Identification of existing and potential private operators</td><td rowspan="2">Subsidy systems for plowing and micro-planning And input and service subsidy</td><td>Subsidy for plowing and micro-planning</td><td>Subsidy for plowing and micro-planning</td><td>Subsidy for plowing and micro-planning</td><td>Subsidy for plowing and micro-planning</td><td rowspan="2">Operation of rice enterprises</td></tr>
<tr><td>Input and service subsidy</td><td>Input and service subsidy</td><td>Input and service subsidy</td><td>Input and service subsidy</td></tr>
</table>

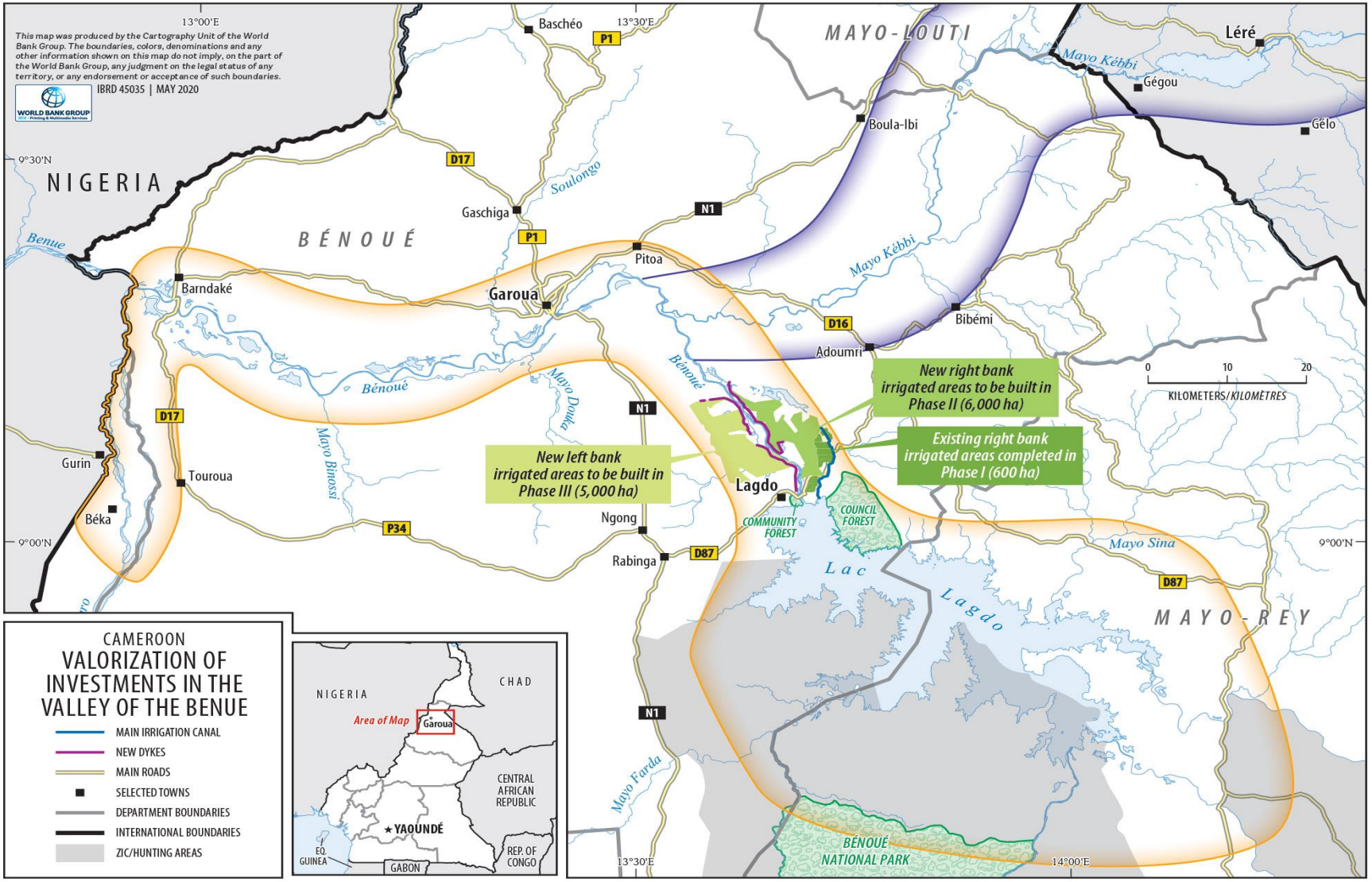
Preparation (2019- 2020)	Year 1 (2021)	Year 2 (2022)	Year 3 (2023)	Year 4 (2024)	Year 5 (2025)	Year 6 (2026)	Year 7 (2027)
	Support for the preparation of BPs for cooperatives and private entrepreneurs and Common Interest Group (CIG)	Support for the preparation/financing of BPs (agricultural/mechanization/ product transformation, agri-services, marketing, etc.)	Support for the preparation/financing of BPs of cooperatives and private companies	Support for the preparation/financing of BPs of cooperatives and private companies	Support for the preparation/financing of BPs of cooperatives and private companies	Support for the preparation/financing of BPs of cooperatives and private companies	Operation of co-ops, GiEs, private agricultural production, processing and services companies, and agricultural maintenance workshops
	Updating of operational procedures manuals		Support for agricultural machinery maintenance workshops	Support for agricultural machinery maintenance workshops	Support for agricultural machinery maintenance workshops	Support for agricultural machinery maintenance workshops	
	Operational planning		Warantage capacity building	Warantage capacity building	Warantage capacity building	Warantage capacity building	Operation of agricultural warantage systems
	Professionalization of the seed sector/structuring of actors Planning of support activities for the seed sector	Installation and start-up support for seed cooperatives, training + equipment/technical support/seed quality, etc.	Technical and organizational support for seed coops, training + equipment / technical support/seed quality, etc.	Technical and organizational support for seed co-ops, training + equipment/technical support/seed quality, etc.	Professionalization of seed coops, training, certification + equipment/technical support/seed quality, etc.	Empowerment of seed coops, quality certification	Seed quality monitoring and certification
	Installation of a technological innovation center in Lagdo	Installation of the innovation perimeter and training infrastructures; Technical and technological innovation tests	Tests of innovations and adaptive Research and Development (R&D) of sustainable intensification of irrigated rice	Tests of innovations and adaptive R&D of sustainable intensification; Variety selection Climate Smart	Tests of innovations and adaptive R&D of sustainable intensification; Variety selection Climate Smart	Tests of innovations and adaptive R&D of sustainable intensification; Variety selection Climate Smart	Tests of innovations and adaptable R&D of sustainable intensification; Variety Selection
	Planning of R&D activities						

Preparation (2019- 2020)	Year 1 (2021)	Year 2 (2022)	Year 3 (2023)	Year 4 (2024)	Year 5 (2025)	Year 6 (2026)	Year 7 (2027)
	Launch of priority tests of technical and technological innovations with partner farmers	Rice varietal selection; AC tests and diversification of agricultural production	cultivation; Variety selection Climate Smart Agriculture (rice, onion, corn, sorghum, fruit trees, fish farming, cultivation under cover, fertilization, small mechanization, cultural associations, etc.)	Agriculture (rice, onion, corn, sorghum, fruit trees, fish farming, cultivation under cover, fertilization, small mechanization, cultural associations, etc.)	Agriculture (rice, onion, corn, sorghum, fruit trees, fish farming, cultivation under cover, fertilization, small mechanization, cultural associations, etc.)	Agriculture (rice, onion, corn, sorghum, fruit trees, fish farming, cultivation under cover, fertilization, small mechanization, cultural associations, etc.)	
	Preparation of training modules and curricula	Technical and professional training	Capitalization of results; Technical and professional training	Capitalization of results; Technical and professional training	Capitalization of results; Technical and professional training	Capitalization of results; Technical and professional training	Capitalization of results; Technical and professional training
	Organization of the basic seed production process	Production of pre-base seeds and rice bases/processing, etc.	Production of pre-base seeds and rice bases/processing, etc.	Production of pre-base seeds and rice bases/processing, etc..	Production of pre-base seeds and rice bases/processing, etc.	Production of pre-base seeds and rice bases/processing, etc.	Production of pre-base seeds and rice bases
	Creation/structuring of the Lagdo CGER	Development of services to agricultural businesses:	Creation of the Garoua CGER; Development/stren	Strengthening of services to businesses in the	Consolidation of business service capacities	Business services	Business services

Preparation (2019- 2020)	Year 1 (2021)	Year 2 (2022)	Year 3 (2023)	Year 4 (2024)	Year 5 (2025)	Year 6 (2026)	Year 7 (2027)
	Planning the development of CGER activities; Awareness and training of local actors	accounting, management, subsidy, organizational and strategic advisory support; Awareness and training of local actors	gthening of business services: accounting, management, subsidy, organizational and strategic advisory support	agricultural sector: accounting, management, subsidy, organizational and strategic advisory support			
3 – Capacity Building and Implementation							
Ongoing studies: MEADEN institutional audit; Lagdo watershed management master plan; PMP; Social influx management plan ; Stakeholder engagement plan; Baseline situation; ESMF; RPF/Social Assessment/RAP; Rules of MEADEN land tenure; Manuals of	Reorganization of MEADEN/creation and reorganization of services	Institutional support to MEADEN/strengthening of services	Institutional support	Institutional support	Institutional support	Support for the empowerment of MEADEN	MEADEN autonomy
	Operational planning of MEADEN activities in Lagdo and in the Benue valley	Support for the creation and development of CFFPA (agricultural vocational training center)	Support to CFFPA	Support to CFFPA	Support to CFFPA		
		Subsidy from agricultural training institutions	Subsidy from agricultural training institutions	Subsidy from agricultural training institutions	Subsidy from agricultural training institutions		
	Signing of grant agreements for agricultural training institutions in Lagdo and Garoua	Training of internal and external actors	Training	Training	Training	Training	
			Promotion of Lagdo rice at national level	Promotion of Lagdo rice at national level	Promotion of Lagdo rice at national level		
			Knowledge exchanges	Knowledge exchanges	Knowledge exchanges		Land regulation

Preparation (2019- 2020)	Year 1 (2021)	Year 2 (2022)	Year 3 (2023)	Year 4 (2024)	Year 5 (2025)	Year 6 (2026)	Year 7 (2027)
procedures (3); Markets Strategy; Communication Strategy; Law/water support				Organization and implementation of a hydraulic infrastructure maintenance fund	Maintenance of hydraulic infrastructure with WUAs	Maintenance of hydraulic infrastructure with WUAs	
			Funding of scholarships for agricultural students	Funding of scholarships for agricultural students	Funding of scholarships for agricultural students	Funding of scholarships for agricultural students	
	Adoption/ implementation of new law on water and WUAs	Land regulation	Land regulation	Land regulation	Land regulation	Land regulation	
	Establishment of partnership agreements with IRAD, AFRICA RICE, SAED, NBA, and MINADER	Technical support for rice intensification and agricultural diversification	Technical support for rice intensification and agricultural diversification	Technical support for rice intensification and agricultural diversification	Technical support for rice intensification and agricultural diversification	Technical support for rice intensification and agricultural diversification	End of the VIVA BENUE project
	Implementation of the VIVA BENUE project	Implementation of the VIVA BENUE project	Implementation of the VIVA BENUE project	Implementation of the VIVA BENUE project	Implementation of the VIVA BENUE project	Implementation of the VIVA BENUE project	
	Implementation of project M&E	Implementation of project M&E	Implementation of project M&E	Implementation of project M&E	Implementation of project M&E	Implementation of project M&E	

ANNEX 9: Map


This map was produced by the Cartography Unit of the World Bank Group. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of the World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.
IBRD 45035 | MAY 2020
WORLD BANK GROUP
13°00'E
13°30'E
14°00'E
9°30'N
9°00'N
NIGERIA
BÉNOUÉ
MAYO-LOUTI
MAYO-REY
Baschéo
Gaschiga
Garoua
Barndaké
Pitoa
Boula-Ibi
Léré
Gégou
Gélo
Bibémi
Adoumri
Lagdo
Touroua
Gurin
Béka
Ngong
Rabinga
Benue
Soulongo
Bénoué
Mayo Kébbi
Mayo Dinolaka
Mayo Binossi
Mayo Sina
Mayo Farda
Lac Lagdo
D17
D16
D87
N1
P1
P34
New right bank irrigated areas to be built in Phase II (6,000 ha)
Existing right bank irrigated areas completed in Phase I (600 ha)
New left bank irrigated areas to be built in Phase III (5,000 ha)
COUNCIL FOREST
COMMUNITY FOREST
BÉNOUÉ NATIONAL PARK
0 10 20
KILOMETERS/KILOMÈTRES
CAMEROON
VALORIZATION OF INVESTMENTS IN THE VALLEY OF THE BENUE
MAIN IRRIGATION CANAL
NEW DYKES
MAIN ROADS
SELECTED TOWNS
DEPARTMENT BOUNDARIES
INTERNATIONAL BOUNDARIES
ZIC/HUNTING AREAS
NIGERIA
CHAD
Area of Map
Garoua
CENTRAL AFRICAN REPUBLIC
YAOUNDÉ
EQ. GUINEA
GABON
REP. OF CONGO