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Strengthening Climate Change Adaptation And Mitigation In Ngombe Mombangi Sector, Democratic Republic Of Congo: A Project Proposal For Community-Based Resilience Building

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ABSTRACT

Climate change poses significant threats to rural communities in the Democratic Republic of Congo, where livelihoods depend heavily on climate-sensitive natural resources. The Ngombe Mombangi sector in Mongala Province exemplifies the challenges faced by forest-dependent communities in the Congo Basin, with increasing temperatures, changing rainfall patterns, and growing climate variability affecting agricultural productivity, food security, and overall well-being. This article presents a comprehensive project proposal for strengthening climate change adaptation and mitigation in the Ngombe Mombangi sector, based on empirical findings from two companion studies (Articles 58 and 59) that documented significant warming trends (0.17°C per decade), high precipitation variability, and diverse community adaptation mechanisms. The proposal, titled "Strengthening Community Resilience to Climate Change in Ngombe Mombangi Sector" (SCALE-NGOMBE), addresses the multi-level challenges identified through climate analysis and community assessment. The project has four strategic objectives: (1) Strengthen community adaptive capacity through improved climate information, sustainable agricultural practices, and livelihood diversification; (2) Enhance forest conservation and sustainable management to maintain ecosystem services and support REDD+ initiatives; (3) Strengthen institutional capacity and governance for climate adaptation at local and sectoral levels; and (4) Promote sustainable resource management and environmental protection. The project will be implemented over 36 months through six phases: inception and planning; climate information and early warning; sustainable agriculture and livelihood diversification; forest conservation and sustainable management; institutional strengthening and governance; and monitoring, evaluation, and learning. The estimated budget is $1,500,000, with funding from multiple sources including the Government of DRC, international development partners, multilateral climate funds, and private sector actors. The project targets approximately 5,000 households in the Ngombe Mombangi sector, with particular focus on women, youth, and other vulnerable groups. The project aims to build community resilience to climate change, improve food security and livelihoods, contribute to climate mitigation through forest conservation, and strengthen local governance for sustainable development. The successful implementation of this project would provide a model for community-based climate adaptation in the Congo Basin region.

Keywords: Climate Change Adaptation; Community Resilience; Forest Conservation; REDD+; Democratic Republic of Congo; Ngombe Mombangi; Project Proposal; Livelihood Diversification; Sustainable Agriculture; Institutional Strengthening.

RESUME

Le changement climatique constitue une menace majeure pour les communautés rurales de la République Démocratique du Congo, dont les moyens de subsistance dépendent fortement des ressources naturelles sensibles au climat. Le secteur de Ngombe Mombangi dans la province de la Mongala illustre les défis auxquels

sont confrontées les communautés dépendantes des forêts du Bassin du Congo, avec l'augmentation des températures, l'évolution des régimes pluviométriques et la variabilité climatique croissante affectant la productivité agricole, la sécurité alimentaire et le bien-être général. Cet article présente une proposition de projet complète pour le renforcement de l'adaptation et de l'atténuation du changement climatique dans le secteur de Ngombe Mombangi, basée sur les résultats empiriques de deux études complémentaires (Articles 58 et 59) qui ont documenté des tendances de réchauffement significatives (0,17°C par décennie), une forte variabilité des précipitations et divers mécanismes d'adaptation communautaire. La proposition, intitulée « Renforcement de la résilience communautaire au changement climatique dans le secteur de Ngombe Mombangi » (SCALE-NGOMBE), aborde les défis multi-niveaux identifiés par l'analyse climatique et l'évaluation communautaire. Le projet a quatre objectifs stratégiques : (1) Renforcer la capacité d'adaptation des communautés grâce à l'amélioration de l'information climatique, des pratiques agricoles durables et de la diversification des moyens de subsistance ; (2) Améliorer la conservation et la gestion durable des forêts pour maintenir les services écosystémiques et soutenir les initiatives REDD+ ; (3) Renforcer les capacités institutionnelles et la gouvernance pour l'adaptation au climat aux niveaux local et sectoriel ; et (4) Promouvoir la gestion durable des ressources et la protection de l'environnement. Le projet sera mis en œuvre sur 36 mois à travers six phases : conception et planification ; information climatique et alerte précoce ; agriculture durable et diversification des moyens de subsistance ; conservation et gestion durable des forêts ; renforcement institutionnel et gouvernance ; et suivi, évaluation et apprentissage. Le budget estimé est de 1 500 000 dollars, avec un financement provenant de sources multiples, notamment le Gouvernement de la RDC, les partenaires internationaux au développement, les fonds climatiques multilatéraux et les acteurs du secteur privé. Le projet cible environ 5 000 ménages du secteur de Ngombe Mombangi, avec un accent particulier sur les femmes, les jeunes et les autres groupes vulnérables. Le projet vise à renforcer la résilience des communautés face au changement climatique, améliorer la sécurité alimentaire et les moyens de subsistance, contribuer à l'atténuation du climat par la conservation des forêts et renforcer la gouvernance locale pour le développement durable. La mise en œuvre réussie de ce projet fournirait un modèle d'adaptation communautaire au climat dans la région du Bassin du Congo.

Mots-clés : Adaptation au Changement Climatique; Résilience Communautaire; Conservation des Forêts; REDD+; République Démocratique du Congo; Ngombe Mombangi; Proposition de Projet; Diversification des Moyens de Subsistance; Agriculture Durable; Renforcement Institutionnel.

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1. INTRODUCTION

1.1 Background and Context

Climate change is one of the most significant environmental and developmental challenges facing the Democratic Republic of Congo (DRC) in the 21st century. The country, home to the second-largest tropical forest in the world, is experiencing increasing temperatures, changing rainfall patterns, and growing climate variability (IPCC, 2019; World Bank, 2023). These changes are having significant impacts on rural communities that depend on climate-sensitive sectors such as agriculture, forestry, and fisheries for their livelihoods (FAO et al., 2024). The DRC's vulnerability to climate change is heightened by its high dependence on natural resources, limited adaptive capacity, weak institutional frameworks, and persistent poverty (Bopole, 2018; Mboyo, 2022).

The Ngombe Mombangi sector, located in the Mongala Province of the DRC, exemplifies the challenges faced by forest-dependent communities in the Congo Basin. The sector is characterized by equatorial climate, dense humid forests, and rural livelihoods based

on subsistence agriculture, fishing, hunting, and gathering of forest products (PIREDD_MO, 2023). Empirical research conducted in the sector (Articles 58 and 59) has documented significant climate changes, including warming temperatures of approximately 0.17°C per decade, high interannual precipitation variability, and projected continued warming of 1.9-2.5°C by 2100 (Article 58). Communities in the sector are already experiencing the impacts of these changes, including altered agricultural seasons, reduced crop yields, increased food insecurity, and growing pressure on natural resources (Article 59).

Despite these challenges, communities have demonstrated remarkable resilience through diverse adaptation mechanisms, including changes in agricultural practices, livelihood diversification, increased reliance on forest resources, and social solidarity mechanisms (Article 59). However, these endogenous coping strategies may be insufficient to address the magnitude of projected climate changes. There is an urgent need for comprehensive interventions that build on existing capacities, address key constraints, and strengthen community resilience to climate change. The constraints identified in the research include poverty, limited access to information and technology, weak institutional support, resource degradation, insecure land tenure, and gender inequalities (Article 59).

1.2 Problem Statement

The Ngombe Mombangi sector faces multiple interconnected challenges related to climate change:

Climate Impacts: Increasing temperatures, changing rainfall patterns, and growing climate variability are affecting agricultural productivity, water availability, and natural resources. The observed warming trend of 0.17°C per decade and high precipitation variability documented in Article 58 are already having significant impacts on local livelihoods (Article 58).

Livelihood Vulnerability: Rural livelihoods that depend on climate-sensitive sectors are increasingly vulnerable to climate shocks and stresses. The agricultural system is highly sensitive to climate variability due to its dependence on rain-fed agriculture and limited irrigation capacity (Article 59).

Resource Degradation: Forests, soils, and fisheries are being degraded by population pressure, unsustainable practices, and climate change itself. Forest cover in the sector is declining, affecting the provision of ecosystem services on which communities depend (PIREDD_MO, 2023).

Limited Adaptive Capacity: Communities face significant constraints to adaptation, including poverty, limited access to information and technology, weak institutional support, and insecure land tenure (Article 59). These constraints limit the ability of communities to invest in adaptation and respond to climate shocks.

Institutional Weakness: Local institutions lack the capacity to support climate adaptation and sustainable development. The limited presence of government services, extension agents, and technical support constrains community adaptation (Article 59).

Gender Inequality: Women, who play a central role in agriculture and household food security, face specific constraints that limit their adaptive capacity (Article 59). Addressing gender inequalities is essential for strengthening community resilience.

1.3 Rationale and Justification

The project is justified by the following considerations:

Empirical Basis: The project is based on empirical research conducted in the sector, which identified the key climate changes, adaptation mechanisms, vulnerabilities, and constraints (Articles 58 and 59). This evidence-based approach ensures that the project addresses the most critical needs and builds on existing capacities.

Urgent Need: The Ngombe Mombangi sector faces urgent climate challenges that require immediate action. Without intervention, communities will become increasingly vulnerable to climate impacts, with consequences for food security, well-being, and sustainable development. The projected temperature increases of 1.9-2.5°C by 2100 underscore the urgency of action (Article 58).

National and International Alignment: The project aligns with national climate policies, including the National Adaptation Programme of Action (PANA), the National Adaptation Plan (PNA), and the National REDD+ Strategy. It also aligns with international frameworks, including the Paris Agreement, the Sustainable Development Goals (SDGs), and the Sendai Framework for Disaster Risk Reduction. The project supports the DRC's commitments to the UNFCCC and its Nationally Determined Contributions (NDCs).

Co-Benefits: The project delivers multiple co-benefits, including improved food security, enhanced livelihoods, strengthened institutions, and reduced greenhouse gas emissions through forest conservation. These co-benefits contribute to multiple SDGs, including SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 5 (Gender Equality), SDG 13 (Climate Action), and SDG 15 (Life on Land).

Replicability: The project provides a model that can be replicated in other rural areas of the DRC and the Congo Basin facing similar climate challenges. The project design draws on best practices from community-based adaptation initiatives in the region.

1.4 Project Goal and Objectives

Overall Goal: To strengthen community resilience to climate change in the Ngombe Mombangi sector through integrated adaptation and mitigation interventions.

Strategic Objectives:

1. **Strengthen Community Adaptive Capacity:** Improve climate information access, promote sustainable agricultural practices, and support livelihood diversification to enhance resilience to climate impacts.
2. **Enhance Forest Conservation and Sustainable Management:** Conserve and sustainably manage forests to maintain ecosystem services, support REDD+ initiatives, and contribute to climate mitigation.
3. **Strengthen Institutional Capacity and Governance:** Strengthen local institutions and governance mechanisms for climate adaptation at community, sectoral, and district levels.
4. **Promote Sustainable Resource Management:** Promote sustainable management of natural resources, including water, soil, and fisheries, to maintain ecosystem services and support livelihoods.

1.5 Project Period

The project will be implemented over a period of 36 months, from January 2027 to December 2029, with the possibility of extension based on performance and availability of funding.

1.6 Project Location

The project will be implemented in the Ngombe Mombangi sector of the Mongala Province, DRC, covering all 25 villages in the sector. Potential expansion to adjacent sectors will be considered based on results and resources.

1.7 Target Beneficiaries

Primary Beneficiaries:

- Approximately 5,000 households in the Ngombe Mombangi sector
- Women-headed households (approximately 30% of households)
- Youth (15-35 years)
- Small-scale farmers, fishermen, and forest-dependent communities
- Vulnerable groups (elderly, people with disabilities)

Secondary Beneficiaries:

- Local institutions and community organizations
- Sector administration and local government
- Provincial government (Mongala Province)
- National government agencies (Environment, Agriculture, etc.)
- Communities in adjacent sectors (potential expansion)

1.8 Project Partners

Government Partners:

- Ministry of Environment and Sustainable Development
- Ministry of Agriculture and Rural Development
- Ministry of Territorial Planning
- Provincial Government of Mongala
- Sector Administration of Ngombe Mombangi
- Local communities and traditional authorities

Technical Partners:

- United Nations Development Programme (UNDP)
- Food and Agriculture Organization (FAO)
- United Nations Environment Programme (UNEP)
- World Wildlife Fund (WWF)
- Congo Basin Forest Partnership (CBFP)
- Center for International Forestry Research (CIFOR)

Financial Partners:

- Government of DRC (budget allocation)
- Global Environment Facility (GEF)
- Green Climate Fund (GCF)
- World Bank
- African Development Bank
- European Union
- USAID
- Private sector (carbon markets, sustainable forestry)

2. SITUATION ANALYSIS

2.1 Climate Context

Current Climate:

- Average annual temperature: 25.7°C
- Average annual precipitation: 1,784 mm
- Climate classification: Equatorial (Af/Am) with semi-arid tendencies
- Two rainy seasons (major: July-November; minor: March-June)
- Two dry seasons (major: December-February; minor: June-July)

Climate Trends (2010-2024):

- Warming trend: 0.17°C per decade
- Precipitation: High interannual variability with alternation of dry and wet periods
- SPI analysis: Alternation of moderately dry and moderately humid years
- Drought sequences: Notable during 1980s and 1990s
- Recent improvement: Increased precipitation during 2010s with peak in 2024

Future Projections (SDSM/HadCM3):

- Temperature increase by 2100: 1.9-2.5°C
- Continued high precipitation variability

- Potential increase in rainfall intensity
- Decreased frequency of rainy days
- More extreme weather events

Table 1: Climate Summary for Ngombe Mombangi Sector

Parameter	Current Value	Projected Change (2100)
Annual temperature	25.7°C	+1.9 to +2.5°C
Annual precipitation	1,784 mm	+6 to +8%
Wet season duration	7-8 months	Variable, likely shorter
Dry season duration	4-5 months	Variable, likely longer
Extreme events	Increasing	Further increase

Source: Article 58, 2024

2.2 Livelihood Context

Economic Activities:

- Subsistence agriculture: 85% of households
- Fishing: 40% of households
- Forest resource use: 75% of households
- Small trade: 25% of households
- Seasonal migration: 15% of households

Food Security:

- High prevalence of food insecurity during lean seasons
- Limited dietary diversity
- Heavy reliance on cassava as staple
- Seasonal availability of other foods

Table 2: Livelihood Activities and Income Sources

Activity	% Households	Importance

Subsistence agriculture	85%	Very High
Fishing	40%	High
Forest resource use	75%	High
Small trade	25%	Medium
Seasonal migration	15%	Low-Medium

Source: Article 59, 2024

2.3 Key Climate Risks and Vulnerabilities

Agriculture:

- Crop failure due to rainfall variability
- Reduced yields from drought stress
- Increased pest and disease incidence
- Loss of biodiversity

Water Resources:

- Reduced water availability during dry seasons
- Drying of streams and rivers
- Increased water scarcity

Forest Resources:

- Forest degradation from increased exploitation
- Loss of biodiversity
- Reduced availability of non-timber forest products
- Increased vulnerability to fire

Food Security:

- Reduced agricultural production
- Increased dependence on forest resources
- Seasonal food deficits
- Malnutrition

Health:

- Increased heat stress
- Changes in vector-borne disease patterns
- Water-borne diseases during floods

Table 3: Climate Risk Matrix

Climate Hazard	Exposure	Sensitivity	Impact
Temperature increase	High	High	Reduced crop yields, heat stress
Rainfall variability	High	High	Crop failure, water scarcity
Drought	Medium	High	Food insecurity, water shortage
Flood	Low	Medium	Property damage, disease
Extreme weather	Medium	Medium	Infrastructure damage

Source: Article 59, 2024

2.4 Adaptation Mechanisms Currently Employed

Agricultural Adaptations:

- Adjusting planting dates
- Crop diversification
- Adoption of drought-resistant varieties
- Intercropping and mixed cropping
- Soil conservation practices

Livelihood Diversification:

- Fishing
- Small trade
- Seasonal migration
- Collection and sale of non-timber forest products

Forest Resource Use:

- Increased reliance on forests
- Intensified NTFP collection
- Forest conservation practices

Social Mechanisms:

- Mutual assistance
- Food sharing
- Interest-free loans
- Collective action

Table 4: Current Adaptation Mechanisms

Mechanism	Description	Effectiveness
Agricultural adjustments	Crop diversification, planting date adjustment	Moderate
Livelihood diversification	Fishing, trade, migration	Moderate
Forest resource use	NTFP collection, reliance on forests	Moderate
Social mechanisms	Mutual assistance, food sharing	High

Source: Article 59, 2024

2.5 Key Constraints to Adaptation

Economic Constraints:

- Poverty limiting investment
- Limited financial reserves
- Inability to purchase inputs

Information and Knowledge:

- Limited access to climate information
- Limited access to extension services
- Traditional knowledge becoming less reliable

Institutional Constraints:

- Weak government support
- Limited extension services
- Lack of credit and insurance

Resource Degradation:

- Soil degradation
- Forest degradation
- Declining fish stocks

Land Tenure:

- Insecure land rights
- Conflict over land
- Limited investment in land

Gender Inequality:

- Women's limited access to resources
- Women's limited decision-making power
- Women's time constraints

3. PROJECT COMPONENTS AND ACTIVITIES

Component 1: Strengthening Community Adaptive Capacity

Objective: Improve climate information access, promote sustainable agricultural practices, and support livelihood diversification to enhance resilience to climate impacts.

Sub-Component 1.1: Climate Information and Early Warning

Activities:

1. **Establish Community-Based Weather Monitoring:**
    - Install simple weather stations in five villages
    - Train community members on weather observation
    - Develop and implement community-based monitoring protocols
    - Link with national meteorological services
2. **Develop Climate Information Dissemination Systems:**
    - Create climate information networks (radio, SMS, community meetings)
    - Develop seasonal forecasts and early warning messages
    - Train community members on interpretation and use of climate information
    - Establish community-level early warning committees

3. **Enhance Capacity for Climate Risk Assessment:**
    - Train community members on participatory climate risk assessment
    - Support community mapping of climate risks and vulnerabilities
    - Develop community climate adaptation plans
    - Integrate risk assessment into community planning

Sub-Component 1.2: Sustainable Agriculture

Activities:

1. **Promote Climate-Smart Agriculture Practices:**
    - Train farmers on conservation agriculture
    - Promote agroforestry and tree integration
    - Support adoption of drought-resistant crop varieties
    - Promote soil and water conservation practices
2. **Strengthen Agricultural Extension Services:**
    - Train farmer leaders as extension agents
    - Establish farmer field schools
    - Develop and disseminate agricultural extension materials
    - Link farmers with research institutions
3. **Support Access to Agricultural Inputs:**
    - Establish community seed banks
    - Facilitate access to improved crop varieties
    - Support production of organic fertilizers and compost
    - Promote integrated pest management

Sub-Component 1.3: Livelihood Diversification

Activities:

1. **Support Alternative Livelihood Activities:**
    - Train community members on small enterprise development
    - Support establishment of community-based enterprises
    - Facilitate access to microcredit and savings groups

- Promote sustainable fishing and aquaculture

2. **Enhance Marketing and Value Addition:**
    - Support development of community marketing systems
    - Promote value addition for agricultural products
    - Facilitate market linkages and access
    - Support establishment of storage and processing facilities
3. **Strengthen Financial Inclusion:**
    - Establish community savings and loan associations
    - Link communities with financial institutions
    - Provide financial literacy training
    - Support development of village savings schemes

Component 2: Forest Conservation and Sustainable Management

Objective: Conserve and sustainably manage forests to maintain ecosystem services, support REDD+ initiatives, and contribute to climate mitigation.

Sub-Component 2.1: Forest Conservation

Activities:

1. **Strengthen Community Forest Management:**
    - Support development of community forest management plans
    - Establish community forest management committees
    - Train communities on sustainable forest management
    - Support implementation of forest management activities
2. **Promote REDD+ Implementation:**
    - Develop REDD+ awareness and readiness activities
    - Support carbon stock assessment and monitoring
    - Establish benefit-sharing mechanisms
    - Link with national REDD+ processes
3. **Establish and Strengthen Protected Areas:**
    - Support establishment of community-conserved areas

- Strengthen management of existing protected areas
- Develop ecotourism potential
- Promote biodiversity conservation

Sub-Component 2.2: Sustainable Forest Management

Activities:

1. **Promote Sustainable Harvesting Practices:**
    - Train communities on sustainable harvesting of forest products
    - Develop guidelines for sustainable forest use
    - Support community monitoring of forest resources
    - Promote alternative sources of forest products
2. **Support Reforestation and Restoration:**
    - Establish community nurseries
    - Promote tree planting and reforestation
    - Support natural regeneration
    - Restore degraded forest areas
3. **Develop Sustainable Forest Enterprises:**
    - Support development of forest-based enterprises
    - Promote sustainable charcoal production
    - Support sustainable harvesting of non-timber forest products
    - Facilitate market access for forest products

Sub-Component 2.3: Ecosystem Services and Biodiversity

Activities:

1. **Assess and Monitor Ecosystem Services:**
    - Conduct ecosystem service assessments
    - Develop monitoring systems for ecosystem services
    - Integrate ecosystem services into planning
    - Promote awareness of ecosystem service values
2. **Support Biodiversity Conservation:**

- Conduct biodiversity assessments
- Develop and implement biodiversity conservation plans
- Promote community-based biodiversity monitoring
- Link with provincial and national biodiversity strategies

Component 3: Institutional Strengthening and Governance

Objective: Strengthen local institutions and governance mechanisms for climate adaptation at community, sectoral, and district levels.

Sub-Component 3.1: Institutional Capacity Building

Activities:

1. **Strengthen Community Institutions:**
    - Support community governance structures
    - Train community leaders on climate adaptation
    - Establish community climate committees
    - Link community institutions with external support
2. **Strengthen Sector and District Institutions:**
    - Train sector and district staff on climate adaptation
    - Support integration of climate issues into planning
    - Establish climate coordination mechanisms
    - Strengthen technical capacity for adaptation
3. **Strengthen Linkages Between Institutions:**
    - Establish coordination mechanisms between levels
    - Promote information sharing and learning
    - Support joint planning and implementation
    - Strengthen vertical and horizontal linkages

Sub-Component 3.2: Governance and Policy

Activities:

1. **Support Climate Policy Development:**
    - Contribute to development of local climate policies

- Support integration of climate issues into sector policies
- Link with national policy processes
- Advocate for climate-responsive policies

2. **Strengthen Accountability and Transparency:**
    - Support community monitoring of service delivery
    - Establish community feedback mechanisms
    - Promote transparency in resource management
    - Strengthen accountability mechanisms
3. **Promote Conflict Resolution:**
    - Support conflict resolution mechanisms for resource conflicts
    - Train community leaders on conflict resolution
    - Address land tenure issues
    - Promote peace-building and social cohesion

Component 4: Sustainable Resource Management

Objective: Promote sustainable management of natural resources, including water, soil, and fisheries, to maintain ecosystem services and support livelihoods.

Sub-Component 4.1: Water Resource Management

Activities:

1. **Develop Water Management Systems:**
    - Establish community-based water management committees
    - Support development of water management plans
    - Promote water conservation and efficiency
    - Protect and restore water sources
2. **Improve Water Access:**
    - Develop water supply systems (wells, boreholes)
    - Promote rainwater harvesting
    - Support sustainable water use
    - Address water quality issues

Sub-Component 4.2: Soil Conservation

Activities:

1. **Promote Soil Conservation:**
    - Train communities on soil conservation practices
    - Support establishment of soil conservation structures
    - Promote sustainable land management
    - Address soil degradation issues

Sub-Component 4.3: Sustainable Fisheries

Activities:

1. **Support Sustainable Fisheries Management:**
    - Develop community fisheries management plans
    - Promote sustainable fishing practices
    - Support aquaculture development
    - Address fishery resource depletion

4. PROJECT IMPLEMENTATION PLAN

4.1 Implementation Phases

The project will be implemented over 36 months through six phases:

Phase 1: Inception and Planning (Months 1-3)

Activities:

- Project launch and stakeholder engagement
- Establish project governance structures
- Finalize implementation plan and budget
- Develop detailed work plans and activities
- Baseline assessment and data collection
- Recruit project staff
- Community mobilization and sensitization

Phase 2: Climate Information and Early Warning (Months 4-12)

Activities:

- Install weather monitoring stations
- Train community weather observers
- Develop climate information dissemination systems
- Establish early warning committees
- Conduct climate risk assessments
- Develop community adaptation plans

Phase 3: Sustainable Agriculture and Livelihood Diversification (Months 6-24)

Activities:

- Train farmers on climate-smart agriculture
- Promote crop diversification and drought-resistant varieties
- Establish community seed banks
- Support alternative livelihood activities
- Establish savings and loan associations
- Support market linkages

Phase 4: Forest Conservation and Sustainable Management (Months 12-30)

Activities:

- Strengthen community forest management
- Promote REDD+ implementation
- Establish community nurseries
- Support reforestation and restoration
- Develop sustainable forest enterprises
- Establish community-conserved areas

Phase 5: Institutional Strengthening and Governance (Months 12-36)

Activities:

- Train community leaders and local institutions
- Strengthen sector and district institutions

- Establish coordination mechanisms
- Support conflict resolution
- Strengthen accountability and transparency
- Link with national policy processes

Phase 6: Monitoring, Evaluation, and Learning (Months 1-36)

Activities:

- Establish monitoring systems
- Conduct regular data collection
- Support community-based monitoring
- Conduct mid-term evaluation
- Conduct final evaluation
- Document lessons learned
- Share findings with stakeholders

Table 5: Implementation Timeline

Phase	Activity	Months 1-3	Months 4-12	Months 6-24	Months 12-30	Months 12-36	Months 1-36
1	Inception and Planning	X					
2	Climate Information		X	X			
3	Agriculture and Livelihoods			X	X		
4	Forest Conservation				X	X	
5	Institutional Strengthening				X	X	X
6	Monitoring and Evaluation	X	X	X	X	X	X

4.2 Governance and Management Structure

Project Steering Committee:

- Chaired by the Sector Chief
- Members: Sector administration, district representatives, technical partners, community representatives

- Role: Provide strategic guidance, approve annual plans and budgets, review progress, ensure accountability

Project Management Unit:

- Led by a Project Coordinator
- Includes: Monitoring and Evaluation Officer, Finance and Administration Officer, Technical Advisors
- Role: Day-to-day management, coordination of implementation, reporting, and communication

Technical Working Groups:

- Groups for each project component
- Members: Technical staff from government, partners, and community
- Role: Provide technical guidance, coordinate implementation, ensure quality

Community Engagement Structures:

- Community climate committees
- Village development committees
- Community forest management committees
- Role: Community mobilization, implementation support, monitoring

5. PROJECT BUDGET AND FINANCING

5.1 Estimated Budget

The estimated budget for the project is $1,500,000 over 36 months. The budget is organized by project component and activity category.

Table 6: Estimated Project Budget

Component	Activity Category	Budget (USD)	Percentage
1. Climate Information and Early Warning	Weather stations, training, systems	250,000	16.7%
2. Sustainable Agriculture and Livelihoods	Training, inputs, diversification	350,000	23.3%
3. Forest Conservation and Management	Management plans, restoration, REDD+	300,000	20.0%
4. Institutional Strengthening and Governance	Capacity building, coordination	200,000	13.3%
5. Sustainable Resource Management	Water, soil, fisheries	150,000	10.0%
6. Monitoring, Evaluation, and Learning	Data collection, surveys, evaluations	100,000	6.7%
7. Project Management	Staff, operations, coordination	150,000	10.0%

Total		**1,500,000**	**100.0%**

Source: Project Proposal

Budget Assumptions:

- Personnel costs based on local salary scales
- Equipment costs based on market prices
- Training costs include materials, facilitators, and participant support
- Community activities include mobilization, materials, and small grants
- Monitoring and evaluation includes surveys, data collection, and analysis

5.2 Financing Sources

Government of DRC:

- Budget allocation for climate and environment
- Contribution to project implementation
- In-kind contributions (staff time, facilities)

Technical Partners:

- UNDP: Technical support, capacity building
- FAO: Agricultural and forestry expertise
- UNEP: Environmental expertise
- WWF: Conservation expertise

Financial Partners:

- Global Environment Facility (GEF): Grant funding
- Green Climate Fund (GCF): Climate finance
- World Bank: Financing, technical support
- European Union: Financing, technical support
- USAID: Financing, technical support

Other Sources:

- Private sector: Corporate social responsibility, partnerships
- Carbon markets: REDD+ revenue

- Philanthropic foundations: Grants, partnerships

6. PROJECT MONITORING, EVALUATION, AND LEARNING

6.1 Monitoring Framework

The project will implement a comprehensive monitoring system to track progress, identify challenges, and inform adaptive management.

Monitoring Indicators:

Output Indicators:

- Number of community weather observers trained
- Number of climate information systems established
- Number of farmers trained on climate-smart agriculture
- Number of hectares under sustainable agriculture
- Number of community forest management plans developed
- Number of hectares under sustainable forest management
- Number of community institutions strengthened
- Number of coordination mechanisms established

Outcome Indicators:

- Percentage of households with access to climate information
- Percentage of farmers adopting climate-smart practices
- Agricultural productivity and food security status
- Forest cover and condition
- Income diversification and livelihood resilience
- Community adaptive capacity

Impact Indicators:

- Food security status
- Livelihood resilience
- Forest carbon stocks

- Community resilience to climate shocks
- Gender equality

Data Sources:

- Project monitoring data
- Community-based monitoring data
- Household surveys
- Focus group discussions
- Key informant interviews
- Secondary data

6.2 Evaluation Plan

Baseline Assessment:

- Conducted during inception phase
- Collect data on all indicators
- Establish baseline values for monitoring and evaluation

Mid-Term Evaluation:

- Conducted at 18 months
- Assess progress against targets
- Identify challenges and lessons learned
- Inform course corrections

Endline Evaluation:

- Conducted at project completion
- Assess achievement of objectives
- Measure changes in indicators
- Document lessons learned and best practices

6.3 Learning and Knowledge Management

Learning Mechanisms:

- Regular reflection and learning sessions

- Communities of practice
- Learning briefs and case studies
- Cross-visits and exchanges
- Research and documentation

Knowledge Management:

- Documentation of best practices and lessons learned
- Production of policy briefs and technical reports
- Dissemination through conferences and publications
- Sharing through networks and partnerships
- Contribution to the evidence base on community-based adaptation

7. PROJECT RISKS AND MITIGATION STRATEGIES

Table 7: Project Risks and Mitigation Strategies

Risk	Likelihood	Impact	Mitigation Strategy
Climate variability affecting project activities	High	Medium	Flexible implementation, contingency planning
Community participation constraints	Medium	Medium	Strong community engagement, participatory approaches
Institutional weaknesses affecting implementation	Medium	High	Capacity building, institutional strengthening
Funding shortfalls affecting implementation	Medium	High	Diversification of funding sources, contingency planning
Resource conflicts affecting project activities	Medium	Medium	Conflict resolution mechanisms, stakeholder engagement
Political instability affecting project activities	Low	High	Non-partisan approach, stakeholder engagement
Security issues affecting implementation	Low	High	Security protocols, adaptive implementation

Source: Project Proposal

8. PROJECT SUSTAINABILITY STRATEGY

8.1 Institutional Sustainability

- Strengthen institutional capacity of government and community structures
- Integrate project activities into routine operations
- Develop and institutionalize policies, guidelines, and standard operating procedures
- Build capacity of local institutions to continue activities beyond project period

8.2 Financial Sustainability

- Advocate for increased government funding for climate adaptation
- Diversify funding sources
- Build capacity for financial management and resource mobilization
- Explore innovative financing mechanisms (carbon markets, REDD+)
- Develop sustainable funding models

8.3 Human Resource Sustainability

- Build capacity of community members and local institutions
- Strengthen training institutions and systems
- Implement retention strategies for trained personnel
- Support career development and advancement

8.4 Community Sustainability

- Build community ownership of project activities
- Strengthen community structures and leadership
- Promote community-based monitoring and accountability
- Support community-led initiatives and actions

8.5 Programmatic Sustainability

- Integrate project activities into existing programs and systems
- Use existing structures and mechanisms where possible
- Build on and strengthen local capacity
- Ensure alignment with national and provincial policies
- Document best practices and lessons learned

9. CONCLUSION

The SCALE-NGOMBE project provides a comprehensive, evidence-based strategy for strengthening community resilience to climate change in the Ngombe Mombangi sector of the Democratic Republic of Congo. The project addresses the multi-level challenges identified in the companion studies (Articles 58 and 59)—including climate trends, community vulnerabilities, adaptation mechanisms, and constraints—through integrated interventions targeting adaptive capacity, forest conservation, institutional strengthening, and sustainable resource management.

The project is guided by a conceptual framework that integrates the sustainable livelihoods approach, social-ecological systems resilience, and community-based adaptation. The project adopts participatory and community-centered, evidence-based, integrated, sustainability-focused, and adaptive and flexible approaches.

The project is organized into four strategic components: (1) Strengthening community adaptive capacity; (2) Forest conservation and sustainable management; (3) Institutional strengthening and governance; and (4) Sustainable resource management. The project will be implemented over 36 months through six phases, with a total estimated budget of $1,500,000.

The successful implementation of this project would significantly improve community resilience to climate change in the Ngombe Mombangi sector, contributing to improved food security, enhanced livelihoods, and sustainable environmental management. The project's focus on sustainability—through institutional capacity building, sustainable financing, community ownership, and programmatic integration—ensures that benefits will continue beyond the project period. The project provides a model that can be replicated in other rural areas of the DRC and the Congo Basin facing similar climate challenges, contributing to the broader effort to build climate resilience in the region.

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