



REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: LDCF

PART I: PROJECT INFORMATION

| | | | |
|---|-----------------------------------|--------------------------|--------------|
| Project Title: Reducing rural and urban vulnerability to climate change in the Central African Republic by the provision of water supply | | | |
| Country(ies): | Central African Republic | GEF Project ID: 5504 | 5504 |
| GEF Agency(ies): | AfDB | GEF Agency Project ID: | P-CF-E00-008 |
| Other Executing Partner(s): | Ministry of Energy and Hydraulics | Submission Date: | |
| GEF Focal Area (s): | Climate Change | Project Duration(Months) | 48 |
| Name of Parent Program (if applicable): For SFM/REDD+ <input type="checkbox"/> For SGP <input type="checkbox"/> For PPP <input type="checkbox"/> | | Project Agency Fee (\$): | 678,300 |

A. FOCAL AREA STRATEGY FRAMEWORK

| Focal Area Objectives | Expected FA Outcomes | Expected FA Outputs | Trust Fund | Grant Amount (\$) | Co-financing (\$) |
|---|---|--|------------|-------------------|-------------------|
| CCA1: Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas | 1.2 Reduced vulnerability to climate change in development sectors (water and sanitation) | 1.2.1 Vulnerable physical and natural assets strengthened in response to climate change, including climate variability | LDCF | 840,000 | 2,412,000 |
| CCA2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses | 2.2 Strengthened adaptive capacity to reduce risks to climate-induced economic losses 2.3 Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level | 2.2.2 Targeted population groups covered by adequate risk reduction measures 2.3.1 Targeted population groups participating in adaptation and risk reduction awareness activities | LDCF | 3,300,000 | 10,131,000 |
| CCA3: Successful demonstration and deployment of relevant adaptation technology in targeted areas | 3.1 Successful demonstration and deployment of relevant adaptation technology in targeted | 3.1.1 Relevant adaptation technology transferred to targeted groups | LDCF | 3,000,000 | 8,825,000 |
| Total project costs | | | | 7,140,000 | 21,469,000 |

B. PROJECT FRAMEWORK

| Project Objective: Reduce vulnerability to climate change in the provision of drinking water supply | | | | | | |
|--|------------|--|--|------------|-------------------|-----------------------------|
| Project Component | Grant Type | Expected Outcomes | Expected Outputs | Trust Fund | Grant Amount (\$) | Confirmed Co financing (\$) |
| Component 1: Institutional capacity development to facilitate integration of climate risks in water supply and water resources management. | TA | National, regional, municipal and local actors reacts adequately to the uncertain climate conditions and variability | 1.1 Implementation of a training programme for municipal and national and community level 1.2 Strengthening water actors capacity for managing climate change impacts on water supply | LDCF | 630,000 | 3,271,000 |
| Component 2: Reduced vulnerability to climate change in the provision of drinking water supply | Inv | -The vulnerability of the population to climate change, in the provision of drinking water supply will be addressed in the city of Bangui -Enhanced and diversified provision of water sources to rural communities | 2.1 Refurbishment of existing facilities 2.2 Water distribution network enhanced and new facilities are built and operational | LDCF | 5,850,000 | 15,476,000 |
| Component 3: Knowledge Management and Monitoring and Evaluation | TA | Lessons learned and best practices documented and disseminated | 3.1. Lessons learned and best practices documented and disseminated 3.2 Participation to adaptation practioneers events 3.3 Monitoring and evaluation of the project | LDCF | 150,000 | 875,000 |
| Subtotal | | | | | 6,630,000 | 19,622,000 |
| Project management Cost (PMC) ¹ | | | | LDCF | 510,000 | 1,847,000 |
| Total project costs | | | | | 7,140,000 | 21,469,000 |

¹ PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)

Please include letters confirming co-financing for the project with this form

| Sources of Co-financing | Name of Co-financier (source) | Type of Cofinancing | Cofinancing Amount (\$) |
|---------------------------|-------------------------------|---------------------|-------------------------|
| GEF Agency | AfDB | Soft Loan | 1,446,000 |
| GEF Agency | AfDB | Grant | 20,023,000 |
| Total Co-financing | | | 21,469,000 |

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY

| GEF Agency | Type of Trust Fund | Focal Area | Country Name/ Global | (in \$) | | |
|------------------------------|--------------------|----------------|----------------------|------------------|-----------------------------|------------------|
| | | | | Grant Amount (a) | Agency Fee (b) ² | Total c=a+b |
| AfDB | LDCF | Climate Change | CAR | 7,140,000 | 678,300 | 7,818,300 |
| Total Grant Resources | | | | 7,140,000 | 678,300 | 7,818,300 |

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

| Component | Grant Amount (\$) | Cofinancing (\$) | Project Total (\$) |
|--|-------------------|------------------|--------------------|
| International and National/Local Consultants | 571,275 | 1,713,800 | 2,285,075 |

G. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? YES ☐ NO ☒

PART II: PROJECT JUSTIFICATION

The drinking water supply service in Bangui and its environment area is encountering increasingly difficulties according to social destabilization and natural environmental problems. A series of complex natural degradations caused by social conflicts and climate change, such as obsolete infrastructure, deforestation, soil erosion and extreme weather situation, are having considerable negative impact to the natural water resource and the drinking water service in the target zone. The coverage of drinking water service in Bangui is less than 33%. The water service company SODECA (*Société de Distribution d'Eau en Centrafrique*) has several severe difficulties simultaneously. Firstly, the pumping station has lost a large proportion of pumping capacity due to river bed siltation and aging of equipment. After this, almost 70% of the produced drinking water lost by leakages of the distribution network. In the targeted rural areas, drinking water is supplied via non-network separated water points, which is more vulnerable to further environment degradations.

The project funded by GEF/LDCF will focus on activities reducing the impacts of climate change on water supply. It will provide solutions to solve issues such as river bed siltation and network leakage. Due consideration is given to awareness raising and capacity building on adaptation and water resources management, sustainable water supply services. In rural areas, the project will bring drinking water to the local communities already suffering from poverty and are vulnerable to climate change.

In the long term, the project will enhance the global management capacity of the water service company and the integration of climate change issues by all stakeholders.

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF²

There were several important changes made during the project design, from the original PIF. These changes take the form of a different geographical scope and hence, related modifications in the expected outcomes. These outcomes have been changed following result from a thorough full consultative process with stakeholders, via face-to-face meetings and stakeholders workshops in March, April and May 2015.

| Original project design in PIF | Adjustment/improvement made at CEO Endorsement |
|--|--|
| <u>Allocation of GEF resources per component:</u> Comp. 1) \$630K Comp. 2) \$5,850K Comp. 3) \$150K Project Management: \$510K | Detailed budgeting carried out through consultation with communities and the government resulted in several changes to proportions. Changes are within 15% limit and provided in section B, Part I of this document. |

² For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter “NA” after the respective question.

| Original project design in PIF | Adjustment/improvement made at CEO Endorsement |
|--|---|
| <p><u>Baseline scenario:</u> The baseline is the First Sub-programme for Drinking Water Supply and Sanitation (PSEPA), with a national coverage (7 prefectures).</p> | <p>Since the PIF stage, the Sector Sub-programme for Drinking Water Supply and Sanitation was realigned to the national context, with a change in the geographical coverage similar to the one described above. Hence, the PSEPA is targeting specific areas, mainly in Bangui and its surroundings.</p> <p>The “Support Programme for Reconstruction of Grassroots Communities – Phase 1 (PARCB: <i>Programme d’Appui à la Reconstruction des Communautés de base</i>)” was approved by the Bankk’s Board in June 2015 to support social sub-sectors including the water and sanitation sector at local community level. The aim of this program is respond to needs arising from 2013 crisis and support the country’s recovery. This program constitutes baseline scenario. The PARCB will provide 40 boreholes and 40 sanitation facilities in suburbs of Bangui. It will also provide water and sanitation infrastructure in schools, health centers and support provision of water for farm lands (100 ha), aquaculture (15 ha) and livestock rearing.</p> |
| <p><u>Project sites:</u> The intervention in rural areas targeted four districts (<i>prefectures</i>): Bamingui-Bangoran Nana Gribizi, Kemo & Haute Kotto</p> | <p>PSEPA: In terms of geographical coverage, the change is due to the 2013 crisis in the country. For security reasons, the priority is given to the capital city of Bangui and its surrounding areas. The United Nations Multidimensional Integrated Stabilization Mission in Central African Republic (MINUSCA: <i>Mission intégrée multidimensionnelle de stabilisation des Nations Unies en République centrafricaine</i>) is mainly present in Bangui and nearby. However, security situation in the four initially targeted rural areas (Bamingui-Bangoran Nana Gribizi, Kemo & Haute Kotto <i>préfectures</i>) remains volatile.</p> <p>PARCB: The program will initially targets 2 of the country's 7 regions, namely Region 7 (Bangui, the capital) and Region 1 (Ombella Mpoko and Lobaye prefectures). Activities under this phase will gradually expand as security conditions improve and it is expected that soft activities to cover a significant portion of the national territory by 2018. In the following phase, the program intends to expand its geographic coverage to Kémo, Nana Gribizi, Bria, Ouaka and Mambéré Kadéï prefectures, where vocational training and learning centers will be rehabilitated to promote professional reintegration of unemployed youths.</p> |
| <p><u>Total co-financing foreseen:</u> \$23,300,000</p> | <p>Total co-financing mobilized for the water and sanitation sector from PSEPA and PARCB is \$21,469,000.</p> |
| <p><u>Project Strategy:</u> Outputs described with some indications on activities.</p> | <p>Through stakeholder consultation and national validation, the project strategy is now fully developed and activities described. In particular, the project strategy is to engage a various stakeholders in reducing the vulnerability to climate change of the population of Bangui by improving the access to drinking water. The Outputs went through some fine tuning, but Outcomes remains unchanged. The major changes are:</p> |

| Original project design in PIF | Adjustment/improvement made at CEO Endorsement |
|---|--|
| | <p><u>Output 2.1:</u> At PIF stage, the focus was on dredging at Oubangui, the water pipeline intake point. As the dredging will be covered by the restructured PSEPA, the new Output 2.1 will focus on activities aimed at reducing the vulnerability of the urban population, by building and renovating water supply infrastructures and introducing new cost-effective practices, systems and schemes.</p> <p><u>Output 2.2:</u> At PIF stage, the focus was on making a GEF contribution to “<i>promote alternative water sources to local communities in rural areas</i>” in the four <i>prefectures</i> of Bamingui-Bangoran Nana Gribizi, Kemo & Haute Kotto. Given the evolving security situation in those prefectures, physical interventions under Output 2.2 will shift its geographical focus to the rural areas surrounding Bangui.</p> |
| <p><u>Risk Analysis:</u> Cursory analysis based on assumptions and with limited stakeholder consultation.</p> | <p>Thorough risk analysis was carried out and the corresponding management response has undergone stakeholder scrutiny.</p> |

A.1 National strategies and plans

This project is fully consistent with, and supportive of, national development strategies, policies, plans, reports and assessments with respect to climate change, the UNFCCC and the NAPA more precisely – exactly as indicated at PIF stage. The analysis of the policy framework has been refined at CEO Endorsement stage.

The Government of Central African Republic signed the United Nations Framework Convention on Climate Change (UNFCCC) on June 13, 1992 and ratified it on March 10, 1995. The Second National Communication (produced in 2013 and submitted on February 5, 2015) and the 2008 National Adaptation Programme of Actions (NAPA) have been prepared by the country in conformance respectively with Decision 8/CP.11 and Decision 28/CP.7 of the UNFCCC.

The NAPA was adopted in June 2008 and has identified five main areas of vulnerability related to climate change: agriculture, forestry, energy, health and water resources and seven prioritized regions. The project is fully aligned with the area of vulnerability and water resources. The NAPA indicates some important points of intervention for project tackling with climate change in CAR: the social and environmental situation of Chari Basin, the social and environmental situation of Congo Basin, the social and environmental situation of Chad Basin, the temperature, the precipitation, etc.

In addition to result from the NAPA process, the project will contribute to the objectives of the Poverty Reduction Strategy Paper II (PRSP II): The goal of CAR’s second generation PRSP II (2011-2015) is to promote strong growth favorable to the poor and vulnerable people and sustainable human development. It is underpinned by three interdependent strategic thrusts, namely: (i) Peace-building, Governance and Rule of Law; (ii) Economic Recovery

and Regional Integration; and (iii) Development of Human Capital and Essential Social Services. By contributing to meeting the drinking water and sanitation needs of the population of Bangui and rural areas and reintegrating demobilized ex-combatants, the project is consistent with and relevant to chapter 1 and 3 of the strategy. It is also aligned with the implementation of the National Integrated Water Resources Management Plan (PANGIRE). The project is also in line with the Water and Sanitation Sector Plan (PASEA) adopted by the Government of CAR in July 2009.

Looking at gender and mainstream consideration, it should be added that gender equality is a key element that has to be ideally guaranteed for any project. Despite some institutional reforms promoting gender equity, such as the law introduced in 2006 on the protection of women against violence, this issue remains of particular importance in CAR. Indeed, ensuring equity between men and women involved in the project development and setting up within a country where women rights could be improved can help not only to provide a fairer understanding of the project outcomes but also to contribute to raise awareness in the country towards this issue. In CAR, gender issues needs to be tackled, and there is a real interest to study it when developing the current project, especially regarding women's access to water. The gender issue may be of particular importance for water management since the access to the resource may be jeopardized considering inequalities matters (Mitleton-Kelly, 2015)³.

This project is the second LDCF funded project in Central Africa Republic, the first one (GEFID4318 - Integrated Adaptation Programme to Combat the Effects of Climate Change on Agricultural Production and Food Security in CAR) is currently under implementation by UNDP. Ultimate objective of the project as well as the proposed project is to reinforce CAR community's vulnerability to climate change. Complementarities between two projects will be assessed during implementation and lessons learnt be drawn, mainly through communities sensitization to climate change in the water and agriculture sectors.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities

N/A

A.3 The GEF Agency's comparative advantage

The intervention strategy of the African Development Bank (AfDB) in CAR from 2014 onwards aims at creating the enabling conditions for taking greater advantage of CAR's strengths and opportunities. In particular, it consists of easing the constraints relating to very weak governance, inadequate infrastructure and significant development needs to take over from the humanitarian and emergency support of the international community during the transitory post-war period.

Before the conflict, the AfDB had a field office in CAR with 20 staff, including an operations coordinator and an infrastructure specialist as well as experts from other sectors including rural development, private sector, social development, etc. However, but it had to closed down in 2013. The current management is based on an interim, but AfDB is now reopening its country office in CAR.

³ E. Mitleton-Kelly, Report on Gender & Decision Making Focusing on Ocean and Coastal Management Policy, LSE Complexity, 2015

A.4. The baseline project and the problem that it seeks to address

The Drinking Water Supply and Sanitation sector in CAR is under reconstruction after the long crisis experienced by the country. Since 2003, this sector has been going through a comprehensive reform aimed at restructuring the legislative, institutional and organic bodies.

Hence, the Law No. 06/001 of 12 April 2006 on water, the Law No. 05.004 of 13 January 2005 on the hygiene code and the Law No. 07.018 of 28 December 2007 on the environment code were enacted. However, these laws cannot be enforced without their implementing instruments. The institutional reforms have not been completed and have so far generated no significant impact, impeding the development of the sector. To address this situation, the African Water Facility (AWF) hosted at the AfDB has financed the Water Sector Development Institutional Support Project (WSDISP). Among other activities, this project launched a study for the formulation of the institutional, legal and organizational frameworks of the water sector. The conclusions of this study were presented and discussed during a workshop in 2012. The WSDISP also included the development of a national Drinking Water Supply and Sanitation (DWSS) program.

Nevertheless, still today, in Bangui, the population's water supply situation is characterized by generalized shortages in most of the districts because of obsolete or destructed infrastructures. The silting up of the river at the Oubangui waterworks intake impedes the operation of the installation of the city's only production station. This station does not reach its maximum production capacity and shuts down completely during dry periods. This situation is causing recurrent social unrest, likely to undermine the still fragile political stability. In the mid-term, the impacts of climate change are well known. The disturbance in the seasonal precipitations will alter the structure of the river and may cause a change in the runoff. More water laden with sand will need more effort to become drinkable, during flooding episodes. But in average, the Oubangui River is expected to funnel less water. Reduced runoff will increase the pressure on freshwater resources and hence on the water supply of Bangui, especially with more demand for water as population increases.

In rural areas, there are considerable drinking water and sanitation needs, including around Bangui. Some areas record water supply service rates of less than 2%. The absence of major projects is also limiting employment opportunities and affecting the success of Disarmament-Demobilization-Reintegration Programs. In fact, such projects provide the population with alternatives to inappropriate means of livelihood. A far-reaching DWSS action would therefore constitute a specific action for the return of peace in CAR.

In addition to the problems in the supply of water services, the capacity of the General Directorate of Water Resources, the executing agency in the sector, is weak. This weak capacity is in turn affecting the implementation of the DWSS, and when it comes to reducing the vulnerability of the country to climate change. The needs to raise awareness about the consequences of climate change on water supply are significant.

Baseline scenario

The two defined projects are:

- The First Sub-programme for Drinking Water Supply and Sanitation (*PSEPA: Premier Sous-Programme Sectoriel Eau Potable Et Assainissement*)
- The Support Programme for Reconstruction of Grassroots Communities – Phase 1 (*PARCB: Programme d'Appui à la Reconstruction des Communautés de base*)

PSEPA: The project is financed by the AfDB in order to ameliorate the drinking water and sanitation situation in the country. The project covers the city of Bangui and surroundings. Originally (i.e. before the 2013 crisis), it was designed to cover the rural areas in four prefectures: Kémo, Nana-Gribizi, Bamingui-Bangoran and Haute-Kotto.

The scheduled budget of PSEPA was US\$ 23.31 million, but is reduced now to US\$ 7.564 million. The difference was allocated to finance PARCB. PSEPA was initially scheduled to be implemented over a 48-month period from January 2013, but could only start in November 2014. Duration of the project was modified to two years. The main components and activities are summarized in the table below:

| Component | Sub-component | Outputs |
|---|--------------------------------|--|
| Component 1- Studies and Capacity Building | Studies | Detailed designs and Baseline data of the Drinking Water supply of the town of Bangui |
| | | Preliminary Design and detailed designed of the Drinking Water supply of prefectural headquarters |
| | Capacity Building | Support to General Directorate of Water Resources (DGH), SODECA and National Rural Water Supply and Sanitation Agency (ANEA) : training and logistics |
| | | Logistics and Information-Education-Communication Support to social bodies such as Ministry of Social Affairs, National Solidarity and Gender Promotion(MASSNPG), Organization of Central African Women (OFCA) , Women Leaders for Peace-building |
| | | Support to the General Directorate of Environment and Social Economy: training and logistics |
| Component 2- Drinking water and sanitation: | Bangui's Drinking Water Supply | Rehabilitation of the Bangui pumping station and the water treatment station and replacement of the pipeline between the two stations over a distance of 500 meters. Dredging of the Oubangui River next to the pumping station. Rehabilitation of 17 km of pipelines. |
| | Rural Drinking Water Supply | Building 60 boreholes |
| | | Creation of standalone water points (SWPs) and rehabilitation of one existing SWP |
| | | Building latrines |
| | Social Intermediation | Training of community workers; training of village relays; establishment and training of Water Point Management Committees (WPMC) and public latrine management committees |
| | | Training of social entity offices (social affairs, OFCA, Women Leaders for Peace-building) and providing them with Information-Education-Communication (IEC) kits; training in water supply trades of 500 JPN and ex-combatants and providing them with reintegration kits |
| Component 3 - Project Management and M&E | Management and M&E | Administrative and financial management; revision of the procedures manual; parameterization of the existing accounting software; and recruitment of Technical Assistance for the PCU. |

PARCB: The project is considered as a priority by the AfDB and the Government of CAR, with the primary objective to help the poorest local communities in Region 7 (Bangui) and Region 1 (Ombella Mpoko and Lobaye prefectures). The targeted population is characterized by high poverty. The project addresses also food security issues. The PARCB will hence introduce primary social services such as minimum education, health and water and sanitation services, and support rural development activities to increase the resilience of the local communities.

The targeted regions are inhabited by approximately one-third of the CAR population, 85% of which depends on agriculture as their main livelihood. The area is characterized by: (i) extreme poverty and food insecurity compounded by the destruction of livelihoods; (ii) a huge social divide caused by inter-community violence; (iii) inflow of youths (61% of the population, half of whom are out of school and unemployed) who actively participated in inter-community violence due to idleness and lack of vocational opportunities. PARCB 1 will benefit at least 500,000 persons directly and 1,528,985 persons indirectly, representing 32% of the CAR population.

The program will construct 40 boreholes and 40 sanitation in Bangui suburbs and will provide water and sanitation infrastructures to schools, health centers, The program will also support provision of water for farming (100 ha), vegetable gardening, aquaculture (15 ha) and livestock rearing. It will promote the socio-economic reintegration of communities settled in the project area, facilitate access to social services, and ensure the social reintegration of over 500,000 unemployed and out-of-school youths. Approximately 15,000 youths in school (including 30% girls) will be able to get access to good quality vocational training and technical education under the programme.

| Infrastructure activities in baseline projects | Brief description | Climate change mainstreaming and adaptation Benefits |
|--|---|--|
| Dredging of the intake point at Oubangi | Dredge siltation upstream and downstream of intake point. | Activity will enable intake during extreme low water level period. |
| Rehabilitation of pumping stations and the treatment plant | Rehabilitate obsolete pumps and treatment facilities. | Installation of the floating pump system will enable SODECA to cope with severe low water level. |
| Rehabilitation of the distribution network | Rehabilitation of dilapidated pipes in primary and secondary distribution network. | The activity will reduce leakage and improve water use efficiency. |
| Construction and/or rehabilitation of boreholes equipped with hand pumps | Provision of water for schools, health centers, villages and outskirts of Bangui. | The project will conduct hydrogeological survey to ensure sustainability of groundwater sources. |
| Construction of sanitation facilities | Provision of ventilated improved pit-latrines (VIPs) for schools, health centers, villages and shelters in the outskirts of Bangui. | Improved sanitation will contribute in avoiding contamination of water sources. It will be combined with sensitization activities. |

A. 5. Incremental / Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project

The goal of this LDCF/GEF funded project is to reduce rural and urban vulnerability to climate change in the country by the provision of water supply. In Bangui, it means to increase the nominal drinking water production capacity by

building a new pumping station in Bangui, by building new water storage facilities; and to increase drinking water rates respectively from 23% to 67% by 2015 in the targeted rural areas. It will also allow people to reintegrate their respective communities.

During the preparation of the project, a consultative process was adopted through meetings and discussions which made it possible to take into account the different concerns of the population and various sector actors. For the baseline project, in rural areas, meetings with local authorities and more than 300 representatives of entities involved in the sector as well as informal consultations with beneficiaries underscored the need for the sub-programme to provide support for improvement of maintenance, particularly the availability of spare parts, and for training of the actors of various local water supply and sanitation facility management entities. Similar participatory process took place in preparation process of the LDCF funded activities.

In rural areas, water point management committees and public latrine management committees will be established and trained for O&M of the infrastructures installed supervised by National Rural Water Supply and Sanitation Agency (ANEA). Capacity of ANEA will also be strengthened by support by the EU. Organization of Central African Women (OFCA) and Women Leaders for Peace will be trained and provided with Information-Education-Communication (IEC) kits, and National Youth Pioneers (JPN) and ex-combatants will be provided with training on water and sanitation management (local repairer, bricklayer, operating employee, standpipe attendants, quarry operator, solid waste manager, water and sanitation facility manager, cashier, etc.).

While the physical intervention of the LDCF project will focus on Bangui and its surrounding rural areas, soft components will eventually benefit the whole country through capacity development to government institutions and knowledge management.

Component 1: Institutional and analytical capacity development to facilitate integration of climate risks in water supply and water resources management.

Outcome 1: National, regional, municipal and local actors reacts adequately to the uncertain climate conditions and variability.

Component 1 will support the institutional capacity development of government at the regional and municipal (Bangui) level and enables communities to react to unpredictable climatic conditions events, such as extreme precipitation, drought, floods, etc. by promoting investments for adaptation and flexibility that are accompanied by soft activities, such as:

Output 1.1. Training programme for municipal and national and community level. The practitioners in the targeted zone are not well aware of the fact and the consequence of climate change. The Ministry of Environment, the only administration dealing with climate affairs with the international community, does not manage any operational activities in the domain of water supply and sanitary. The Ministry of Energy and Hydraulics, which is in charge of the activities above stated, has no systematic information canal with the international and regional institutes / organisation of climate change issues. The training programme prepared for municipal, national and community levels' practitioners must focus on the general awareness of climate change and its consequences. In terms of activities, the project will:

- Prepare a series of trainings for stakeholders in community level in order to give them a basic notion of climate change. The contact person who follows the water supply / sanitation projects, the community chiefs and representative of drinking water final users shall be the receivers of training. The training shall give a clear picture about climate change and its consequence on drinking water supply chain. This will enable trainees shall be able to identify basic climate change impacts, and able to react correctly to consequences of negative climate situation (for instance, by protecting water points and boreholes in case of extreme precipitation and flood).
- Prepare a series of trainings for stakeholders at the municipal level in order to give them a basic notion of climate change, and integrated water resources management (IWRM) skills related to climate change. The targeted stakeholders of this training programme shall be technical and managerial employees of municipalities and contact person for water supply and sanitation. The training shall give a clear picture about climate change and its consequence in drinking water supply chain with a management simulation. This will enable trainees to identify basic climate change impacts, and to react correctly to consequences of negative climate situation. The managerial staff shall be able to make right decisions in regards with climate change consequences or extreme weather situations.
- Prepare a series of trainings for stakeholders at national level in order to give them a basic notion of climate change, integrated water resources management (IWRM) and strategy making skill in tackling climate change. Government cabinet and related decision makers, legislators shall be the receivers of this training programme. The training shall give a profound and strategically meaningful knowledge structure to the trainees about climate change and its consequence on drinking water supply chain, with a decision making simulation. This will enable the trainees to identify climate change impacts, and to react correctly to consequences of climate change and extreme weather situation. The decision-makers shall be able to implement relevant political and technical strategy dealing with climate change consequences and extreme weather situations.

Output 1.2. Strengthening water actors' capacity for managing climate change impacts on water supply. The available resources for water managers in Central Africa Republic are very limited, for both hardware and software aspects. The LDCF project shall provide assistance by ensuring both necessary hardware and software for data collection, data storage, data analysis, management schedule making and action plans implementation. In terms of activities, the project will:

- Provide apparatus for raw water quality, drinking water quality monitoring. Water quality parameters of raw water such as turbidity, pH, COD, BOD, Dissolved Oxygen etc, shall be measured each morning. The water quality of produced drinking water shall be monitored in continue with online sensors.
- A technical team of laboratory will be formatted and well trained for analysis and reporting. The reporting system shall be integrated into the global water management.
- An action and reaction working plan will be defined with external experts and local water managers. The plan elaborates the reaction against varies types of crisis and extreme situations, including climate change impacts and extreme climate situations.
- A series of software for data storage, data analysis and reporting shall be made available. A training of usage for related water managers shall be implemented.

Rational and additional for this component

The baseline project is focused on the feasibility and pre-feasibility studies development as well as on the enhancement of the capacities of water-related organizations with no consideration of how to manage uncertainties associated to climate change. In addition to responding to this need the LDCF project will also provide in rural areas adequate training to local communities in order to ensure that proposed water-supply alternative solutions (from component 2) are adequate to the needs and to the local culture.

Component 2: Reduced vulnerability to climate change and the shortage of drinking water production and distribution

The vulnerability of the population to climate change, in the provision of drinking water supply, will be reduced in the city of Bangui and in rural areas around Bangui. The main problems and activities as well as the additionality of the two sub-components are presented below.

Outcome 2.1: Distribution network rehabilitated
Outcome 2.2: Pump station is rehabilitated
Outcome 2.3: Installation of a 1000 m³ water tower
Outcome 2.4: Implementation of a new pumping station

Output 2.1. The proposed solution is to cope with fluctuation of river water-level due to climate change and variability. The LDCF funding will be used for building a new pumping station, expanding the drinking water pipelines network, and building a water storage facility of 1,000 m³. These works will allow sufficient water intake in case of extreme low-water level and ensure reliable water production for the supply of Bangui. This investment will be additional to the AfDB investment project that will rehabilitate and strengthen the facilities.

The output will support the water management governmental institutions to tackle the decreasing pumping efficiency which is one of the consequences of climate change. Siltation caused by multiple climate change consequences is considered as the biggest obstacle for raw water pumping. The LDCF project will support related adaptation activities, such as:

- The LDCF project will rehabilitate and strengthen of the capacity of pipeline. Another operation to increase the global raw water intake capacity is to assure the transportation efficiency. In the case of Bangui, the leakages in the canalization must be avoided as much as possible. In terms of activities, the project will increase the length of the drinking water network by 10 km.

Output 2.2: The pump station rehabilitated. At Bangui, renew the existing pumping station into a capacity of 2000m³ raw water pumped per day.

Output 2.3: Installation of a 1000 m³ water tower. The target is that 1000 m³ of water can be stored and make up for a fluctuating water supply

Output 2.4: Implementation of a new pumping station

At Bangui, put another pumping point available in order to increasing pumping capacity. There are several barriers for raw water pumping for SODECA's facility. Siltation and degradation of aged pumping apparatus are the two most important among others. The LDCF project will decrease the impact of siltation and put capable equipment available for SODECA. In terms of activities, the project will enable the construction of a new pumping point at a location that is less impacted by siltation of the river bed. Considering the budget restriction, this pumping point shall be designed as a quite simple facility.

Outcome 2.5: Autonomous water point built
Outcome 2.6: Boreholes with human-operated pumps are installed
Outcome 2.7: Feasibility study and detailed design completed for Bangui

In rural areas around Bangui, the need for drinking water and sanitation is acute. Some areas have rates of service less than 2% and the poverty index is high (the national average is of 62.4%). People rely on surface runoff from mountain area for water supply. However, magnitude of runoff variability is increasing and average discharge dwindling due to climate change and variability.

Output 2.5: In addition to the provision and rehabilitation of hand pumps and standalone water points by the AfDB investment, the LDCF resources will contribute in reducing the vulnerability to climate change by providing alternative water sources and increasing storage capacity. These activities consist of building 50 new boreholes in the rural areas near Bangui, including the rehabilitation and construction of deeper wells depending on the hydrological and geological conditions in the areas. These activities will promote diversification of water sources and at the same time increased number of people gratified by the additional investments. Groundwater monitoring equipment, rain gauge and data management system will be installed to monitor long term trend of groundwater level to take appropriate measures in timely manner if necessary.

This will support the communities and ANEA to increase the global coverage of drinking water supply. Along with the development of climate change, the target zone will loss water resource in all kinds of natural recipients. The efforts to tackle the depleting water resource consist of exploring as much as possible measurements to valorize different water intake opportunities. The LDCF/GEF project will support related adaptation activities, such as promoting alternative water sources to local communities in rural areas. Water resource for civil use in rural areas can be diversified. The project will explore all possible measurement nowadays and establish pilot projects for future up-scaling.

Output 2.6: Boreholes with human-operated pumps are installed

- 2 water points with boreholes with solid protection structure, submission pump, solar power system, and service kiosks.
- 48 normal water points with boreholes with solid protection structure.

Output 2.7: Feasibility study and detailed design completed for Bangui

Component 3: Knowledge management and monitoring and evaluation

Knowledge and experience of the approaches applied in the project will help the country better cope with similar urban and rural water supply challenges. This component will help the learning process by drawing lessons and making them available for future use. The main activities under this last component are:

Outcome 3.1: Lessons learned and best practices documented and disseminated to raise awareness of effective climate risk management options for further up-scaling.

Output 3.1: Lessons learned and best practices are documented and disseminated

- Sensitization of all stakeholders about project implementation status
- Stakeholder's consultation during project implementation
- Stakeholder's involvement during project implementation

This activity will be held both during and after the project through several communication tools including internet, radio and prospectus. In particular, a regular update of the official website will be done to way to gather all relevant information that must be spread during and after the project to stakeholders.

Outcome 3.2: Support to participation to adaptation practitioner's events and knowledge management events for dissemination.

Output 3.2: Participation to international and regional conferences related to climate change in water sector. In terms of activities, the project will facilitate participation of institutions in Central Africa Republic in events and conferences related to climate change and water sector.

Sustainability: To different extents, water scarcity is a global issue striking all countries across regions. This project has outcomes that aim to provide a more sustainable water management through institutional, technical and management improvements. The sustainability will be ensured thanks to the direct and indirect benefits of the project: in the short run, it will imply cost savings that will represent a serious advantage for both the government and the local inhabitants, and in the long run, it will save water resource and help keeping providing water to local population. The impact on local communities will be also efficient since the access to clean water concern the overall population in Central African Republic. In particular, women and children will be strongly concerned by the benefits of the project by being less exposed to waterborne diseases, which represents a serious issue for breastfeeding and the general child development.

Sustainability of the proposed project depends on the sound management of water and sanitation facilities. In rural areas, the management method adopted is community management. However, this requires supervision of the beneficiary population. In the current context, this role lays with ANEA which currently does not have adequate human resources and logistic means. As mentioned above, capacity building for ANEA will be supported through the program to improve the sustainability of the project.

Given the financial constraints and limited capacity of the government, the only feasible financing to enable sustainability is tariff revenues in the Central Africa Republic. The proposed project and baseline projects will support activities to improve tariff collection both in rural and urban areas.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks

The project risks have been altered to become much more specific in their analysis of risks based on measures to be implemented in the project. They are described below.

Table 1: Summary of risks and mitigation measures

| Risks | Description | Probability of occurrence | Impact | Mitigation |
|------------------------------|---|---------------------------|---|---|
| In all project phases | | | | |
| Security | Persistent general insecurity in suburb Bangui and even some districts in the city | Medium to high | Impossibility to complete the project | Regular assessment of the security situation with the help of United Nations agencies, French troops and the government; Developing partnerships with renowned local NGOs in areas with security risks; Install pilot installations in high security areas. |
| Governance | Possibility that funds allocated to the project are not used, due to the lack of culture of transparency within the Project Management Unit | Medium | Decommissioning of project funds leading to incomplete implementation of the various phases of the project. | Appointment of a Steering Committee composed of representatives of key government institutions (MHE), Ministry of Finance, regularly evaluating the expenses incurred by the Project Management Unit, the procedures underway for specific activities, and regularly auditing the financial and activity reports. |
| Site accessibility | Access roads to the site in poor | Low | Delays in site visit, on-site | - Good planning necessary for on-site activities, integrating the many |

| | | | | |
|--|--|----------------|---|--|
| | conditions | | construction and training activities | uncertainties ; - Choice of sites accessible from major centers by secured roads |
| Studies Phase | | | | |
| Opportunity | Slowness and bureaucracy red tapes during the study launch process | Medium | Delay in implementing the various phases of feasibility studies | Close supervision of the execution of the steps for the appointment of consultants and strengthening the PMU to avoid the bureaucracy |
| Project Planning Phase | | | | |
| Financial | Delay in the availability funding | Low | Delay in payments causing delays | Detailed financial plan approved during the study phase, and medium and long term timetables designed with disbursement dates agreed. |
| Site configuration | Changes in the site configuration (soils, etc.) caused by human activity and potential landslides | Low | Substantial changes in the construction phase and its cost | Site selection and feasibility studies should take into account all these details |
| Delay in construction | The recruitment procedure for a contractor is slow | High | Delay in the civil works and commissioning of the new pumping point | Detailed plans and deadlines are set during the tendering process; Penalties will be applied when a contractor is found off budget or if there is a late delivery of the works; The goods to be imported shall be granted an exempting tax system. Security guarantee for contractor during tender procedure |
| Goods and services | Increase in the market price of materials and equipment | Low | Change in the design and plans | Detailed and well-managed procurement process that provides goods and services from sources with a very good reputation Choose contractors with rich experiences in the regions or in countries of same situation. |
| Operation and maintenance phase | | | | |
| Siltation of river bed | Sand accumulated in the pumping intake area of the river bed | Medium | Paralyze the existing and new built pumping point | - Site selection of the new pumping point should be based on detailed hydraulic investigation; - Dredging service shall be well contracted with liable contractor for the raw water intake zone |
| Inadequate maintenance | The MHE operates intermittently and without proper maintenance after commissioning | Medium | Unwanted water cut or extreme low pumping efficiency | - Appropriate training and involvement of technical employees; - Development of training materials; - Preparation for budget of maintenance in the tender phase; |
| Financial | Low income of populations that causes a low ability to pay for water bills | Medium to high | Project sustainability affected | - For rural areas, a local management committee will manage collected tariff and ensure maintenance of water infrastructure and upscale water distribution network in the future. - In urban area, the national water distribution company (SODECA) will manage water infrastructure through collected tariff For more details, see section on |

| | | | | |
|---------|--|----------------|--|--|
| | | | | sustainability in page 20. |
| Overall | | Medium to high | | - Several specific risks have been identified, with results in the overall range of a medium to high risks project |

A.7. Coordination with other relevant GEF financed initiatives

N/A

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

Since the outbreak of the conflict, some initiatives have been undertaken within the international community in general to stabilize the country. This was concluded by the signing of agreements between parts (rebels and the state) for a political transition process. A road map was also adopted. The agreements have enabled a strong mobilization of the international community especially with the gradual deployment of the International Support Mission to CAR under African leadership (MISCA) from July 2013 and the creation of integrated multidimensional UN Mission (MUNISCA) in July 2014.

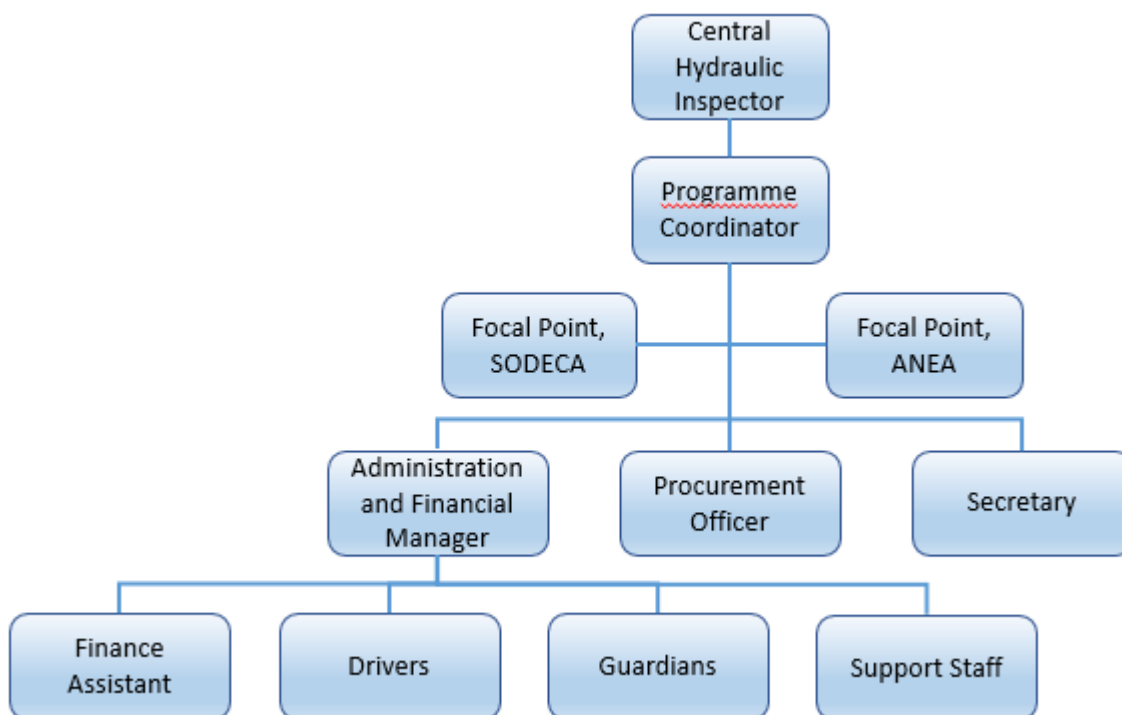
This mobilization of the international community to stabilize the country and to support the political transition has also allowed the Technical Financial Partners (TFP) to lift the suspension on their assistances and operations. Besides the road map for the transition, which aims to address the urgent needs for organizing presidential elections in 2015, the Transitional Government has developed and adopted a Sustainable Recovery Program (SRP) for the period 2014-2016.

The aid coordination mechanism in CAR was built around the Poverty Reduction Strategy Paper (PRSP I) (2008-2010) and rolled over for the PRSP II (2011-2015). The Water-Hygiene-Sanitation Thematic Group steered by UNICEF will ensure the coordination of the sector's stakeholders under the strengthened sector. In the water and sanitation sector, government and donors had already finalized in 2012 the National Water and Sanitation Program, 2030 which included an institutional mechanism for its implementation. The baseline projects are already aligned to the national programme. The propose activities supported by LDCF resources will be considered as sub-components of the baseline projects which are part of the national programme.

The government and SODECA have presented some weaknesses to hold these activities in the past, which could be a serious obstacle to the implementation of the project. To augment the implementation capacity of the government, Program Coordination Unit (PCU) will be created in the General Directorate of Water (DGH) of the Ministry of Energy and Hydraulics (MEH), the executing agency. The PCU will be enhanced by technical assistances (a Hydrologist, Environmental, Climate Change and Monitoring & Evaluation experts). DGH is responsible for developing and monitoring annuals programs, annual budgets for activities, payment applications, progress reports, financial statements and annual audit. The coordination of technical activities is ensured by the coordinator assisted by the administrative and financial expert, procurement expert and support staff.

In addition to the PCU, the project will seek advice and guidance from the existing Steering Committee (SC) Composed of ministries of Economy; Finance and Budget; Interior and Decentralization; Public Health, Population and AIDS Control; Social Affairs, National Solidarity and the Family; Environment and Ecology; SODECA; Civil society organizations (one for NGOs, one for women’s associations); and MEH. Membership will be extend to Ministry of Defense, the Organization of Central African Women (OFCA) and the Association of Women Leaders for Peace-building. The SC will ensure linkage between the ongoing and future sub-programme actions, coordination between different line ministries as well as coherence between this operation and sector policies currently in force. It will ensure the smooth implementation of the different sub-programme components and smooth coordination with other donors’ activities. The PCU will provide secretarial services for the SC.

Organizational Structure for the Programme Management



In consultation with the European Union, coordination platform was defined to avoid any duplication particularly in Kémo and Nana Gribizi prefectures. Similarly, proposed activities for Bangui are complementary to those initiated by the World Bank under Emergency Project for the Rehabilitation of Urban Infrastructure and Services (PURISU). Discussions with donors helped to define the potential synergies to be developed within the context of on-going and future operations.

During the preparation of the baseline project, a consultative process was adopted through meetings and discussions which made it possible to take into account the different concerns of the population and various sector actors. In rural areas, meetings with Local Authorities and more than 300 representatives of entities involved in the sector as well as informal consultations with beneficiaries underscored the need for the sub-programme to provide support for improvement of maintenance, particularly the availability of spare parts, and for training of the actors of various local water supply and sanitation facility management entities.

Additional stakeholder consultations took place for the preparation of the LDCF activities including meetings with ministries involved in the water sector: Ministry of Energy and Water; Ministry of Environment; the Ministry of Interior; Ministry of Social Affairs, National Solidarity and Gender Promotion, development partners such as the World Bank and European Union, FAO, WFP, UNFPA and UNICEF and international NGOs. The consultation was to seek potential synergies and complementarity between different activities.

The team also visited project target areas and held meetings with representatives of Ministry of Social Affairs, National Solidarity and Gender Promotion; 30 representatives from network of the Organization of Women in Central Africa (OWCA); 12 representatives of Associations of Female Leaders for peacebuilding; NGOs; 100 representatives from collective committees (in schools and health centers) in boreholes and others; 300 women who are selling fish from Oubangui River; 150 members of youth groups working in market gardening and environmental management in the 4th District (unsecure district in Bangui); and 30 neighborhood leaders in districts to appreciate the actual situation and needs on the ground.

In total the team met with more than 700 stakeholders from different entities including potential beneficiaries during which the team informed the populations about the objectives of the project and sought their feedback. The teams also emphasized the needs of stakeholder mobilization and involvement in the management of water and sanitation facilities in order to prevent the impact of climate change. This participatory approach will be maintained during implementation of the activities.

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

The project approach is to establish the institutional capacity, systems and potential for improving the supply of drinking water. The institutional sustainability will be assured by focusing on capacity building, both for water services management and adaptation purposes.

- The project has been carefully designed to optimize prospects for improving the sustainability of the drinking water supply system.
- A rural development dynamism would be generated as rural population will now have access to drinking water, thus improving health and generating an additional source of income.
- The project will work with local institutions (e.g. water user groups) to develop technical capacity required to maintain water pumps in rural areas.
- The project will seek to achieve gender equality through the empowerment of women to fully participate in all project activities and specifically those related to capacity development under the various project components.
- Participation of civil society, through the involvement of NGOs, including women NGOs, and stakeholder consultations, in the decision-making process related to drinking water services, and for information and awareness raising activities.
- Reduction of GHG emissions: Given the need to install water pumps, it is proposed to introduce, as a pilot, two solar water pumps.

Environmental sustainability will be promoted in the project by improving the effectiveness of water supply efforts in a way which avoids GHG emissions (through manual and solar pumps for instance in rural areas). Indeed, GHG emissions represent a high factor contributing to global warming and, to a larger extent, to the consequences of climate change. Given the objectives of the project, which mainly focus on addressing climate change impacts

through water provision, reducing the effects of climate change will foster the initiatives aiming to provide a regular access to clean water.

Gender and Climate Change: The realization of works and the CC training will contribute to empowerment of women and youth. In addition, temporary jobs like restoration will be created during the construction. The project will create at least 540 permanent jobs, 40% will be allocated to women (including management of water points). Water points will be equipped with solar energy that can be exploited for lighting. Improved water and sanitation access will increase the enrollment at the primary schools (current rate is 59%, with only 39% for girls) in the country. Increasing the flow and quality of water should ensure the population's access to drinking water from 28% to 67% in 2020 in Bangui. These results will have immediate benefits on the health of mothers, children and family well-being. The gain of time achieved on reducing the distances (from 5 km to 500 meters in rural areas and less than 50 meters in urban areas) to search for water should have positive effects on productivity and increased income. Information-Education-Communication (IEC) activities for behavior changing vis-à-vis the water-hygiene-health will decrease the prevalence of diarrheal diseases from 25.7% to 10% by 2030.

Sustainability

To ensure the sustainability of investments (Human-powered wells, rural water distribution networks (mini-water tower and standpipes), Urban water distribution network (water tower, distribution network, etc.), a periodic maintenance activities will take place both for rural and urban areas. In urban areas, maintenance will be provided by the water distribution company (SODECA) financed by collected tariff and management system.

In rural areas, a community based management system is adopted and coordinated with authorities at regional level. Currently, this role is assigned to the National Agency for Water and Rural Sanitation (ANEA) whose capacity will be strengthened by the baseline project funded by AfDB.

ANEA provides mentoring services to communities on the management and maintenance of infrastructures and creates networks of local artisans and repairers. The baseline project is currently funding the construction of spare parts warehouses in local regions. The European Union also supports ANEA for the signing of a protocol with spare parts suppliers.

For the management of rural schemes, it is proposed to create two management level systems:

- a) Water users associations (WUAs) for rural water network (02 mini-water towers and standpipes) - WUA includes members from different communities benefiting from a water tower and will manage funds collected at each standpipe connected to the tower. This association will ensure maintenance of the water tower, make decisions on new investments including expansion of the water system etc.
- b) Local water users associations (LC-WAU) for 50 human-powered wells - for each human-powered wells, LC-WAU will be created for the management of the infrastructure. LC-WAU are responsible for collecting water tariff from users, finance small maintenance and coordinate with WUA.

Financial resources

Since there is no free drinking water system in the Central African Republic, the price of a cubic meter of water was negotiated with communities and users as follows:

- In rural areas: the price of cubic meter of water is set by the WAU and LC-WAU in coordination with ANEA, as a result of balance between user's willingness to pay and maintenance cost for water wells and tower. The price of water is currently 10 FCFA per 20 liter in rural areas (prices currently practiced) or 500 FCFA/m³.
- In urban areas, SODECA and municipalities meets once a year to discuss the sustainability of investments. The price is 365 FCFA/m³ in Bangui (average selling price in force including royalties), less than \$ 1US. In 2015, average price of water in urban area is 500-600 FCFA, around \$ 1.5/m³.

Disaggregated targeted Indicators (beneficiaries)

The implementation of the baseline and GEF component projects will benefit for at least 1,500,000 inhabitants (51.8% women) of Bangui and surrounding rural areas, to access to drinking water. The number of populations in Bangui increased because of migration caused by insecurity in rural since March 2013. It should be recalled that in the baseline program, it was planned to increase the rate of access to water from 28% to 67% in 2015, but this goal was not achieved because of the armed conflict started in March 2013 which has delayed the project implementation. As a long term objective, the project plans to achieve 80% of beneficiaries with access to water in 2025 in Bangui and rural municipalities.

The initial subprogram has planned to realize the following works: (i) dredging the bed of the River Oubangui; (ii) the rehabilitation of the pumping station and the treatment plant; (iii) partial rehabilitation (17km) of the distribution network; (iv) the completion of 60 boreholes equipped with HP; and (v) the construction of 40 latrines. These achievements would bring the flow of water pumped from 750 m³ / h to 1500 m³ / hour by the end of 2015.

The Complementary project plans to achieve the following facilities: (i) the establishment of additional 10 km of pipe network; (ii) installation of a water tower with a capacity of 1000 m³ to improve the quality and consistency of water supply despite the vagaries of the weather; (iii) the creation of a new pumping station and renovation of the existing station; (iv) to realize feasibility studies for new pumping station and water levels and for the construction of a new pumping station; (v) renovation of the existing pumping station; (vi) installation of 50 new boreholes in the surrounding areas of the capital Bangui; and (vii) training and awareness, as well as broadcasts of knowledge at national, regional and international level.

These achievements bear additional water flow pumped in Bangui from 1,500 to 2,000 m³ / hour in 2019 and will serve 585,000 additional people with 51.8% women in 2019. This rate reached 28% in Bangui in 2015, just 420 000 people (men and women) are serving. The complementary project includes training of 170 stakeholders (governments, NGOs and private) and 100 managers in the water sector (involved ministries and managers of water points). Information-Education-communication (IEC) activities will be conducted through radio and door to door for behavioral change vis-à-vis water-hygiene-health. These activities will induce the decrease in the prevalence rate of diarrhea by 25.7% to below 10% by the year 2025. Approximately 1,000 000 (of which 50% of women) and rural districts of Bangui will be sensitized in the prevention against disasters and adaptations to climate measures in 2019 and 450 000 people (50% of women) will handle the situation of vulnerability to Climate change and find adaptation responses in 2025. In addition, 5,000 members (40% of women) of water management groups (50 boreholes equipped with solar panel) will be trained in technical to maintain solar panels and operating facilities. Revenues generated by the sale of water and membership fees will make regular maintenance works. It should be noted that the sale of water users is 10 FCFA per 20 liter in rural areas (prices currently practiced) and 365

FCFA / m3 in Bangui (average selling price in force including royalties), which will know in the coming years an increase to reach 398 FCFA / m3 or 428 FCFA / m3.

According to the surveys conducted in 2012 and 2015, monthly expenses related to the treatment of waterborne diseases are of 10,000 CFA (\$20) to 60,000 FC FA (\$120) per persons (treatment, salary loses, etc.) per person while these expenditures were 2 times less before 2012. The quality of drinking water will have a great impact in health expenditure. It is expected the reduction of waterborne disease prevalence rates from 25.7% in 2015 to 10% in 2025.

B.3. Explain how cost-effectiveness is reflected in the project design:

The project will seek to achieve a situation in which the urban and rural population of Bangui is more resilient to climate change, by securing the supply of drinking water. Costs incurred in project implementation will focus only on those additional actions required to provide key incremental assistance to the Government of CAR in undertaking strategic interventions to address the weaknesses in, and improve the supply of water. To accomplish this, the project will complement and build upon the extensive baseline activities already underway in the sector (e.g. the PSEPA, new legislations, etc.).

Wherever possible, the project will use the competencies and technical skills within the mandated government and public institutions such as ANEA and SODECA to implement project activities. Where applicable, project resources will also be deployed to strengthen and expand existing initiatives and programs to avoid duplication of effort. Co-financing commitments will continue to be targeted by the project during the project implementation (e.g. co-financing of the private sector, co-financing of the NGOs, co-financing of other donors, etc.).

During the PPG phase, the beneficiaries and local/regional authorities discussed different options to implement the project. A number of alternatives were considered for project interventions which are described below along with the reasons for selection/rejection.

Technical solutions retained are based on existing options for improving the climate-resiliency of water sources in CAR. A list of the technical solutions, primary alternatives explored, and the reasons for rejection of those alternatives are as follows:

| Alternative explored | Advantages | Reason for rejection | Selected / Rejected |
|--|---|----------------------|---------------------|
| Gravity Flow Schemes (Rehabilitation of water distribution network) | <ul style="list-style-type: none"> - Relatively easy to rehabilitate existing infrastructure and to distribute large quantity of water - Easy maintenance and low maintenance cost - Easy to scale up – extend | | Selected |
| Pumping station | <ul style="list-style-type: none"> - Large quantity of water pumped - Long service duration - Low maintenance cost - Easy to replicate – local manufacturer | | Selected |
| Construction of Big-water tower 1,000 cube meters | <ul style="list-style-type: none"> - Easy to cover large population - Low maintenance cost | | Selected |

| | | | |
|--|---|--|----------|
| | - Easy to manage with existing SODECA system | | |
| Mini-water Towers | - Easy to cover rural communities - Low maintenance cost - Easy to manage with existing ANEA system | | Selected |
| Use of spring water | | - Insufficient quantity water - Unstable quantity of water acquired - scale-up limited | Rejected |
| Human-powered Wells | - Very well adapted for rural areas - Easy to maintain - Almost zero operating cost - Low maintenance cost - Existing network of artisans repairers | | Selected |
| Water distribution by trucks | | - Large initial investment (purchase of trucks) - Significant maintenance cost - Risk of car-jacking by rebellion troops | Rejected |
| Installation of community and household-level rainwater harvesters | | - Sizable investment needed (water saving Tanks or mini-dam, etc) | Rejected |

The project is considered cost-effective for the following primary reasons:

- Project support to secure the access of drinking water is expected to improve the overall cost-effectiveness of the water services in Bangui. It is anticipated that a modest investment of GEF resources will result in: (a) significant improvements in the internal water supply system of the CAR; (b) more efficient flows of water-related information within the governmental authorities; (c) improvements in the individual skills of water services management staff in related to the stress coming from climate-related extreme events; (d) more cost-effective user fee.
- Project investments in the rehabilitation of some installations or the development of new ones will significantly increase the incomes generated from supply of water. It will increase the income streams, particularly from the medium-income households. This additional financing will then be used to subsidize an incremental improvement in the quality and extent of water supply management activities in Bangui and surroundings. Project support for detailed assessments on tools and funding mechanisms or improving the institutional framework may contribute, over the long-term (i.e. beyond the term of the project), to addressing some of the fundamental weaknesses in the current administration of the drinking water supply services.

C. DESCRIBE THE BUDGETED M&E PLAN

The project will be monitored through the following M&E activities.

Inception stage:

A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, the African Development Bank office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of AfDB staff vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- b) Based on the project results framework, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Based on the initial risk analysis submitted, the risk log shall be regularly updated. Risks become critical when the impact and probability are high. Note that for GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of value chain actors are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other indicators can be used to monitor issues, lessons learned etc... For instance, the extent to which lessons have been efficiently learnt can be assessed through the number of people (among the public and stakeholders) are aware of climate change vulnerability and of adaptation responses, and participations to adaptation practitioners events through the indicator “Number of skill outputs related to climate change generated and disseminated”.

Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period. The APR/PIR combines both AfDB and GEF reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes — each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

Periodic Monitoring through site visits:

The AfDB will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the AfDB and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle:

The project will undergo an independent Mid-Term Review at the mid-point of project implementation. The Mid-Term Review will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the Mid-Term Review will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-Term Review will be prepared by the AfDB based on guidance from the Regional Coordinating Unit and GEF. The GEF Focal Area Tracking Tool for adaptation will also be completed during the Mid-Term Review cycle.

End of Project:

An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the Mid-Term Review, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the AfDB based on guidance from the Regional Coordinating Unit and GEF.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS.

The GEF Focal Area Tracking Tool for adaptation will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Project Monitoring and Evaluation Workplan and Budget

| Type of M&E activity | Responsible Parties | Budget USD | Time frame |
|--|---|--|---|
| Inception Workshop and Report | Project Manager PMU – GoCAR- AfDB | Indicative cost: \$20,000 | Within first two months of project start up with the full team on board |
| Measurement of Means of Verification of project results. | Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. PMU, esp. M&E expert | To be finalized in Inception Phase and Workshop. | Start, mid and end of project (during evaluation cycle) and annually when required. |
| Measurement of Means of Verification for Project Progress on output and implementation | Oversight by Project Manager PMU, esp. M&E expert Implementation teams | To be determined as part of the Annual Work Plan's preparation. Indicative cost is \$50,000 | Annually prior to ARR/PIR and to the definition of annual work plans |
| ARR/PIR | Project manager PMU AfDB | None | Annually |
| Supervision/monitoring | AfDB | \$50,000 (\$200,000 total) | Twice a year |
| Periodic status/ progress reports | Project manager and team | None | Quarterly |
| Mid-term Review | Project manager PMU AfDB External Consultants (i.e. evaluation team) | Indicative cost: \$44,000 | At the mid-point of project implementation. |

| Type of M&E activity | Responsible Parties | Budget USD | Time frame |
|------------------------------|---|--|--|
| Terminal Evaluation | Project manager PMU AfDB External Consultants (i.e. evaluation team) | Indicative cost : \$44,000 | At least three months before the end of project implementation |
| Audit | Project manager PMU | Indicative cost per year: \$13,000 (\$52,000 total) | Yearly |
| Visits to field sites | AfDB (as appropriate) Government representatives | For GEF supported projects, paid from IA fees and operational budget | Yearly for AfDB |
| TOTAL indicative COST | | US\$ 410,000 | |

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)


A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the Operational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

| NAME | POSITION | MINISTRY | DATE (MM/dd/yyyy) |
|---------------------------|-----------------|---|-------------------|
| Bertrand-Blaise NZANGA | GEF Focal Point | MINISTRY OF ENVIRONMENT, ECOLOGY AND SUSTAIBNABLE DEVELOPMENT | 06/22/2013 |

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

| Agency Coordinator, Agency Name | Signature | Date (Month, day, year) | Project Contact Person | Telephone | Email Address |
|------------------------------------|--|----------------------------|------------------------|------------------|-----------------|
| Mahamat ASSOUYOUTI |  | 07/06/2015 | Sylvie P.BARA | +225 20 26 23 97 | s.bara@afdb.org |
| | | | | | |

ANNEX A: PROJECT RESULTS FRAMEWORK

| CENTRAL AFRICAN REPUBLIC: Complementary project for reducing vulnerability of rural and urban populations to climate change through water supply in CAR | | | | | | |
|---|--|---|---|---|---|------------------------------|
| Goal: to reduce vulnerability and reinforce adaptation of water resources management face climate change through water supplying | | | | | | |
| RESULTS CHAIN | | PERFORMANCE INDICATORS | | | SOURCES OF VERIFICATION | RISK/ATTENAUTIO N MESURES |
| | | Indicators | Baseline scenario | Target 2025 | | |
| IMPACT | Impact: Reduce vulnerability of population increase adaptation to CC in managing water resources | 1.1.1 Prevalence of water-borne diseases. 1.1.2 Number of people (public, policymakers, private, men, women and youth) who manage the situation of vulnerability to CC and provide adaptive responses. | 1.1.1.1 (25.6%) in 2006 1.1.1.2 (129/100000) Infantile mortality 1.1.1.3 maternity mortality 8,9/1000 1.1.2 (1%). | 1.1.1 10% 1.1.1.2 (58/100000) 1.1.1.3 (2,2/1000) 1.1.2 (30% of population) 50% women. | National demography survey Statistics (UNICEF) | |
| | RESULTS CHAIN | Indicators | Baseline scenario 2015 | Target 2019 | sources of verification | |
| OUTCOMES | 2.1 The resilience of the population to CC (climate change) is enhanced to the question of the risks of climate variability on water supply | 2.1. (0)Number of people (men and women) sensitized and appropriate project. | 2.1.1 (0) | 2.1.1 1 000 000 and 50% women of them. | Project supervision report AfDB evaluation report | |
| | 2.2 The resilience of infrastructure to climate variability has improved | 2.2.1 Number of pipes repaired and resilient (leaks/day) 2.2.2 Number of persons (men and women) who have access to drinking water 2.2.3 Quantity of water available (pumped) per hour in Bangui | 2.2.1 (05) 2.2.2 (28%) 2.2.3 (750 m3/h) | 2.2.1 (0) 2.2.3 (67%) 2.2.3 (2000m3/h) | Completion report Survey, project annual report and supervision reports Project of supervision and annual reports evaluation document | |
| | 2.3 The knowledge acquired during the project are disseminated nationally and internationally. | Number of KM document produced. | 2.3.1 (1) | 2.3.1 50 | | |

| | | | | | | |
|---------|---|--|---|--|---|---|
| OUTPUTS | <p>3. Component 1: Institutional capacity development :</p> <p>3.1 National, municipal and local actors trained and strengthened on the issues of climate change (CC)</p> <p>3.2 Capacities of stakeholders operating in the water sector are strengthened in managing climate change impacts.</p> | <p>3.1.1 Number of national actors trainedNumber of national actors trained</p> <p>3.1.2 Number of municipal actors trained</p> <p>3.1.3 Number of local actors trained</p> <p>3.2.1 Number of project manager in water sector trained</p> <p>3.2.2 Number of structure reinforced</p> | <p>3.1.1 (0)</p> <p>3.1.2 (0)</p> <p>3.1.3 (0)</p> <p>3.2.1 (5)</p> <p>3.2.2 (2)</p> | <p>3.1.1 (20) of which 30% women</p> <p>3.1.2 (50) of which 50 % women</p> <p>3.1.3 (100) of which 30% women</p> <p>3.2.1 (25) of which 05 women</p> <p>3.2.2 (06) includes members of women associations.</p> | <p>New CC review of literature and community practices report</p> | <p>Risk</p> <p>3.1 project's ownership by the population is insufficient</p> <p>Mitigation</p> <p>3.1 Information-Education-Communication or mobilization and sensitization of beneficiaries are budgeted;</p> <p>3.2 Income from the sale of water will be used to maintain works.</p> |
| | <p>4. Component 2 : Component 2: Reduced vulnerability to climate change in the provision of drinking water supply</p> <p>4.1 The distribution network rehabilitated</p> <p>4.2 The pumping station rehabilitated</p> <p>4.3 Water Tower built (1000 m3)</p> <p>4.4 Establishment of a new pumping station</p> <p>4.5 standalone water points (SWPs) setup</p> <p>4.6 Human-operated pumps (HMP) installed</p> <p>4.7 Feasibility study and detailed design completed for pumping station</p> | <p>4.1.1 Km of pipes of asbestos cement replaced</p> <p>4.1.2 Number of pumping stations rehabilitated</p> <p>4.1.3 Number of water tower installed</p> <p>4.1.4 Number of new water kiosk made</p> <p>4.1.5 Number of SWPs made</p> <p>4.1.6 Number of HMP made</p> <p>4.1.7 Number and type of feasibility document produced.</p> | <p>4.1.1 (0)</p> <p>4.1.2 ((1)</p> <p>4.1.3 (1)</p> <p>4.1.4 (0)</p> <p>4.1.5 (0)</p> <p>4.1.6 (0)</p> <p>4.1.7 (0)</p> | <p>4.1.1 (10)</p> <p>4.1.2 (1)</p> <p>4.1.3 (1)</p> <p>4.1.4 (1)</p> <p>4.1.5 (2)</p> <p>4.1.6 (48)</p> <p>4.1.7 Feasibility studies available</p> | | <p>Risk</p> <p>4.1 lack of renewal and maintenance of infrastructure built</p> <p>Mitigation: 4.1 Studies planned will provide details of the cost of investment and renewal. 4.6 Also, income from the sale of water will be used to maintain works. 4.3 The country has a program WSS 2025.</p> |
| | <p>5. Component 3 : Project Management and M&E</p> <p>5.1 Lessons learned and best practices documented and broadcastsons learned and best practices from the project are documented and disseminated</p> <p>5.2 Participation of actors The actors have participated in international events on CC adaptation measures</p> <p>5.3 Management, Motoring and Evaluationoject Management, monitoring and evaluation</p> | <p>5.1.1 Number of person trained on CC vulnerability and adaptation responses.</p> <p>5.1.2 Frequence of lessons learned broadcast</p> <p>5.1.3 Number of seminars realized per year Number of training materials produced and disseminated5.2Number of workshops conducted annually</p> <p>5.2 Number of international missions realized per yearumber of international conference attended per year on CCadaptation measures.</p> | <p>5.1.1 (1%)</p> <p>5.1.2 (1%)</p> <p>5.1.3 (1)</p> <p>5.2 (0)</p> | <p>5.1.1 (50%) of which 30% women</p> <p>1.1.2 (90%)</p> <p>5.1.2 (90%)</p> <p>5.1.3 (02)</p> <p>5.2 (3)</p> | | <p>Risk</p> <p>5.0 Data collected for monitoring are not used</p> <p>5.0 Mitigation:</p> <p>Monitoring and Evaluation Expert, an environmental and climate change Expert and a Hydrologist are integrated into the project management team in view to ensure data dissemination.</p> |

| | | | |
|----------------|---|--|--|
| KEY ACTIVITIES | <i>1. Strengthening of the overall stakeholders comprehension concerning climate issues</i> <i>2. Strengthening of drinking water supply in Bangui city and its surrounding areas</i> <i>3. Knowledge management and monitoring and evaluation, including project management</i> <i>Additional Baseline Project</i> 1. Strengthening the understanding of all stakeholders in Climate Change 2. Reducing vulnerability to climate change through the implementation of water infrastructure 3. Knowledge management, monitoring and evaluation of the project <i>Restructured baseline project</i> 1 Strengthening of Water Sector Capacity 2. Development of DWSS infrastructure 3. Project Management | | |
|----------------|---|--|--|

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

| Comments | Responses |
|--|--|
| <i>Comments from the GEF Secretariat</i> | |
| <ul style="list-style-type: none"> The risk and mitigation section has been expanded ... For PIF stage, this is adequate, with the understanding that a thorough risk assessment and appropriate mitigation measures will be included by CEO endorsement. | <ul style="list-style-type: none"> Detailed risk analysis have been conducted and mitigation measures identified in A.6 of Part II. |
| <ul style="list-style-type: none"> The sustainability of investments is an issue that needs particular attention, and it is expected that, by CEO endorsement, a robust plan will be in place. | <ul style="list-style-type: none"> Sustainability section added in the CEO document. |
| <i>Comments from the United States</i> | |
| <ul style="list-style-type: none"> Provide evidence of scientific and technical reasoning for the proposed water infrastructure projects under sub-component 2.1, including dredging of the river bed around the intake structure and lowering the elevation of the intake structure and explain how they were selected | <ul style="list-style-type: none"> Dredging will be fully covered by the baseline project and will not be financed by LDCF. |
| <ul style="list-style-type: none"> Provide more information on current government technical capacity to analyze data from groundwater monitoring equipment, rain gauge and data management systems, which the proposal states will be installed to monitor long term trends of groundwater level, and how AfDB intends to strengthen such capacity if it is needed; | <ul style="list-style-type: none"> The Government of CAR and the SODECA have presented some weaknesses in managing and analyzing the system. Capacity building on IWRM (A.5 of Part II) will address this weakness as part of the proposed project. |
| <ul style="list-style-type: none"> Clarify how it plans to promote coordination between ministries at both the national and sub-national level. We appreciate the involvement of multiple government agencies, but note the challenges often experienced when coordinating between various ministries and technical agencies. We have seen in other countries with similar program objectives that an inter-ministerial coordinating committee or work group has been instrumental in facilitating dialogue and cooperation between multiple parties. | <ul style="list-style-type: none"> As in B.1 of Part II, coordination between different line ministries and stakeholders will be ensured through steering committee who will provide overall guidance as well as to ensure commitment of stakeholders involved. |
| <ul style="list-style-type: none"> Clarify how it will communicate results, lessons learned and best practices identified throughout the project to the various stakeholders both during and after the project | <ul style="list-style-type: none"> This activity will be held both during and after the project through several ways of communication (with both hard and soft copies). In particular, the official website will be regularly updated to gather and disseminate relevant information (A.5 of Part II). |
| <ul style="list-style-type: none"> Provide more information on how beneficiaries, including women and indigenous groups, have been involved in the development of the project proposal and will benefit from this project | <ul style="list-style-type: none"> Various consultations took place including beneficiaries during preparation of baseline projects. Additional consultation took place during PPG work (B.1 of Part II). The project will reduce the burden associated with the collection of water enabling more time towards social, educational and |

| Comments | Responses |
|--|---|
| | economic activities. Reduced burden for fetching water and improved sanitation facilities in schools are expected to improve school attendance, especially for girls. |
| <i>Comments from Germany</i> | |
| <ul style="list-style-type: none"> Germany welcomes the approach to reduce climate change vulnerability by the provision and improvement of water supply in the Central African Republic. However, it is not clearly presented in the PIF how principles of Integrated Water Resource Management (IWRM) are addressed by the baseline project or the suggested LDCF project. Especially, as the project strategy partly builds on enhanced groundwater extraction (e.g. deeper wells) it is not only important to monitor groundwater levels as suggested in the PIF but also to ensure groundwater recharge capacities right from the beginning. If IWRM measures, including measures to ensure and improve groundwater recharge and water management at the drainage basin level, are implemented sufficiently under the National Integrated Water Resources Management Plan, it should be outlined in the final project document. Otherwise, Germany recommends considering measures of IWRM in the final project document, including the implementation of concrete measures, capacity building, and multi-state cooperation at the river basin level | <ul style="list-style-type: none"> The project will follow the IWRM principles. Sufficient hydrogeological assessment will be conducted to ensure water extraction does not exceed groundwater recharge capacity. As in A.5 of Part II, capacity development on IWRM is part of the proposed project. |
| <ul style="list-style-type: none"> It is explicitly mentioned in the PIF that flood and drought events are the result of environmental and societal factors. However, it is not explicitly mentioned how these factors are addressed. To ensure sustainability, it is urgently recommended to also address the factors contributing to siltation, droughts, and floods, such as land degradation or deforestation. These factors should be addressed within the framework of IWRM. Germany kindly asks to include these aspects in the final project document. | <ul style="list-style-type: none"> The project will conduct capacity development activities on IWRM and sensitize stakeholders on IWRM principles. However, given the scale of activities necessary to address the issues and limited resources to address urgent needs, siltation, flood and drought are not directly addressed under the proposed project. |
| <ul style="list-style-type: none"> If not already done, a thorough analysis and evaluation of available climate change projections for the river basin should be conducted as part of the project. Findings should be reflected in capacity building and infrastructure measures. If such an analysis exists or is planned, it should be referred to in the final project document. | <ul style="list-style-type: none"> This comment is taken into account in the project document, under Component 3 (A.5 of Part II). Data availability on climate change is an issue in CAR, and the proposed activity under the project will enable address this weakness at national level. |
| <ul style="list-style-type: none"> Through the suggested LDCF project it should be ensured that the feasibility and pre-feasibility studies conducted in the framework of the baseline project incorporate climate change aspects and that these are also integrated into the detailed designs and baseline data of drinking water supply. In a climate-sensitive sector as water supply Germany actually regards the integration of climate change as a standard approach in | <ul style="list-style-type: none"> The baseline projects will also mainstream climate change and contribute in improving adaptation capacity. Climate change consideration and adaptation benefit of infrastructure activities in baseline projects are summarized in table in A.4 of Part II. |

| Comments | Responses |
|--|-----------|
| development cooperation. Therefore, the final project document should clearly present how the project will mainstream climate change into the studies and designs. | |

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS⁴

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

| PPG Grant Approved at PIF: | | | |
|--|--|------------------------------------|--------------------------------|
| <i>Project Preparation Activities Implemented</i> | <i>GEF/LDCF/SCCF/NPIF Amount (\$)</i> | | |
| | <i>Budgeted Amount</i> | <i>Amount Spent To date</i> | <i>Amount Committed</i> |
| Consultancies | US\$ 200,000 | US\$ 92,400 | US\$ 132,000 |
| | | | |
| Total | US\$ 200,000 | US\$ 92,400 | US\$ 132,000 |

⁴ If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

Not applicable

ANNEX E: Highest monthly average maximum temperature and Extreme maximum temperature

| Highest monthly average maximum temperature without perspective of Climate Change | Extreme maximum temperature without perspective of Climate Change | Average maximum temperature with perspective of Climate Change | Extreme maximum temperature with perspective of Climate Change |
|---|---|--|--|
| 34°C | 39°C - 40°C | 37°C | Higher than 40°C |

Source: Carbonium

Table 1: Highest monthly average minimum temperature and Extreme minimum temperature

| Highest monthly average minimum temperature without perspective of Climate Change | Extreme minimum temperature without perspective of Climate Change | Average minimum temperature with perspective of Climate Change | Extreme minimum temperature with perspective of Climate Change |
|---|---|--|--|
| 19°C | 16°C - 17°C | 16°C | 13°C - 14°C |

Source: Carbonium

ANNEXE F

Geography of the Central African Republic

CAR is a landlocked country in the heart of Africa with a land area of about 622,980 km². With a population of about 5.3 million, the population density is low (8.5 inhabitants/km²)⁵. The capital city, Bangui, had an estimated population of around 1,500,000 inhabitants in 2014. The spatial extent of the city has markedly increased since the beginning of the 19th century, from 2.12 km² in 1912 to 22.56 km² in the 1960s, and more than 80 km² today. This growth is linked to both the demographic explosion, as in most regions of West and Central Africa, to an intense rural flight, but also to immigration. The study area (latitude: 4°20'–4°30' N; longitude: 18°30'–18°45' E) covers not only the city center, but also the vast suburbs developing along the Ubangi River and to the North along the main road.

The city of Bangui, capital of the country, is located in the Ombella-M'Poko province, on the right bank of the Oubangi River, the northernmost tributary of the Congo River. Since its foundation in 1889, this city has suffered from serious problems of water management. This is mainly due to the specificities of the city's location (steep hills surrounding a large, flat, poorly drained, swampy valley), to the urbanization process responsible for reducing the area of permeable soils, and to the associated increased runoff processes under tropical rainfall conditions. It is a paradox that, although surface waters are abundant in the region, important limitations regarding the drinking water supply have appeared in the last two decades.

As a consequence, a clean and safe drinking water supply is not available to the majority of the population of Bangui. Tap water is only delivered in the very center of the city for just about 20% of the population, leaving the vast majority of the informal settlements of the suburbs with no piped supply, with water being tapped from groundwater via shallow hand-dug wells. The marked increase of the urban area of Bangui, associated with a population explosion and immigration from the rural regions of the Central African Republic, has forced the population to dig deeper wells and to use potentially harmful water to meet their needs⁶. This is particularly worrying for the official authorities in charge of health, given the quasi-absence of sewage systems in the whole Bangui area, and the low income of the urban poor population. Such informal settlements are very common in many big cities of the developing countries of Africa, South-America and Asia⁷. Sub-Saharan Africa has the highest proportion of urban population living in informal settlements⁸, of about 80%. Estimates⁹ demonstrate that, in such informal settlements, more than 80% of the suburban population in developing countries use groundwater for drinking purposes.

In such a context, groundwater quality is a matter of great concern given the ever-growing population and the large amount of waste produced compared to the limited facilities for waste disposal. The city of Bangui experiences such problems and is therefore an interesting case study for Africa. Evaluating the chemical quality of the groundwater of the Bangui region is hence key¹⁰. It is a first step towards a more comprehensive approach to the development of groundwater resources in CAR aiming to find alternatives to direct pumping in the Ubangi River and to provide the population of the suburbs with safer drinking water supply from deep boreholes.

Political instability of the Central Africa Republic and the impact on water supply

In addition to the various difficulties it has to face, CAR is plagued with two fundamental problems which are the weakness of the governance and the extreme poverty of the country, including the State. The budget is extremely reduced. Fiscal revenues, which consist essentially of custom duties, are far from being completely and regularly paid to the Treasury. It is also the case for civil servants and military who, at least from time to time, suffer wages

⁵ World Bank data, CAR, 2014.

⁶ Doyemet 2006

⁷ de Waele et al. 2004, Fantong et al. 2010, Fouépi Takounjou et al. 2010, 90 Rakhmatullaev et al. 2010, Foster et al. 2011

⁸ Takem et al. 2010

⁹ from Tanawa et al. (2002) and Cronin et al. (2006)

¹⁰ The 2010 Takem et al paper presents the results of a preliminary hydro chemical survey carried out in April 2010.

arrears of several months. This also contributes to a large extent to weaken the authority of the Government of CAR.

These fundamental weaknesses, added to the difficult communications within a vast country, have encouraged separatist tendencies in several regions especially in the North and even more in the North-West, along the border with Chad and Cameroon. Since the 2013 crisis, large swathes of the country are not controlled by the central Government. Indeed, this situation influences various aspects of water distribution. First of all, the permanent insecurity in the countryside is the reason why the scope of the present project had to be reduced to just encompass Bangui and its immediate neighboring. Another consequence of the recent past crisis is the looting which occurred on that occasion. As a result, the Ministry of Energy and Hydraulics, the offices of SODECA and other administration were robbed: many computers were lost, as well as many elements of archives, series of data and so on. As a consequence, the ability of the authorities to predict climate-related events such as droughts or floods impacting water supply is inexistent.

Global climate change situation, vulnerability of the water sector to climate change and adaptation problems

Most of the population in Bangui and surroundings comes from poor households and survive with limited access to drinking water. Climate change therefore has an acute impact on their livelihoods. For instance, in rural areas, the high level of rainfall variability poses a risk to production on a land that is traditionally farmed through rainfed agriculture, irrigation and flood recession farming, as well as from pastureland and fishing. A lack of rainfall leads to failed harvests and damages natural vegetation. Heavy rainfall causes flooding and erodes farmland. These changes in climate conditions result in increased food insecurity, social tensions and poverty, and cause a rise in the number of refugees among the affected population.

In terms of water supply of Bangui, all the resource comes from the Oubangui River. The river is formed by the union (near Yakoma, Democratic Republic of the Congo, on the border of the Central African Republic) of the Bomu (Mbomou) and Uele (Welle) rivers, and it then flows west for about 350 miles (560 km). It bends northeast of Bangui and flows a somewhat longer distance southwest. The total length of the Oubangui, with the Uele, is approximately 1,400 miles (2,250 km). Its mean discharge at Bangui is estimated at 151,147 cubic feet (4,280 cubic metres) per second. From May to December, when in flood, the discharge may exceed 494,000 cubic feet (14,000 cubic metres), while during low water (February–April) it drops to 35,300 cubic feet (1,000 cubic metres).

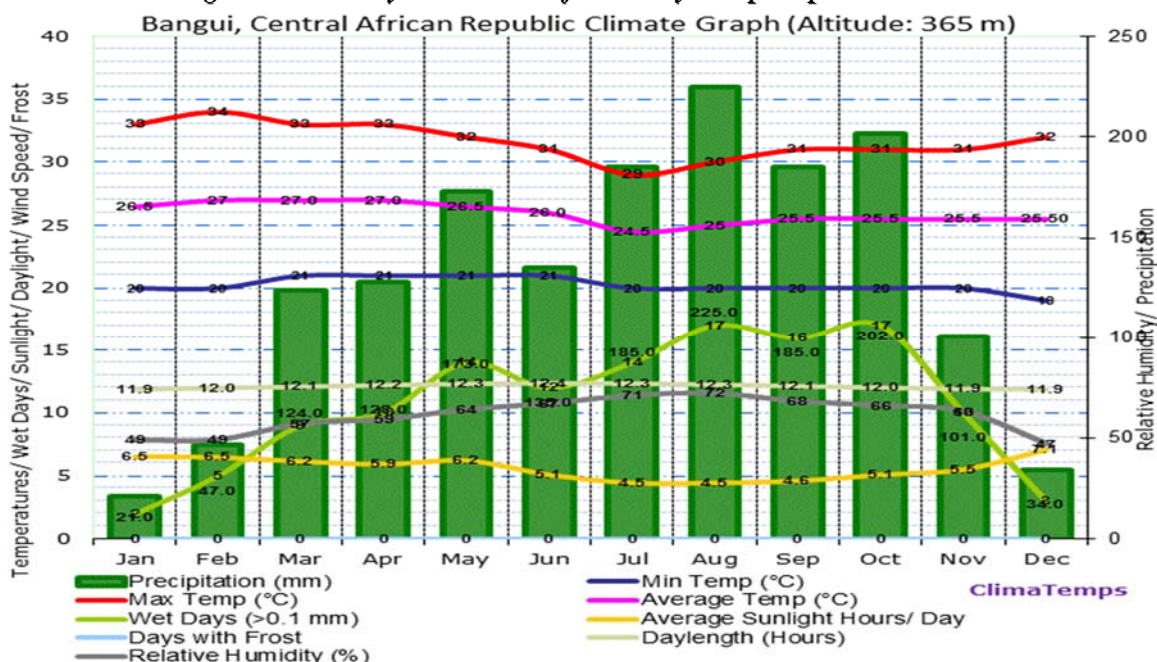
Considering the climate of Bangui, it has a tropical wet and dry/ savannah climate¹¹ with a pronounced dry season in the low-sun months, but no cold season, while the wet season is in the high-sun months. According to the Holdridge life zones system of bioclimatic classification, Bangui is situated in or near the subtropical moist forest biome.

While the warm season is from end of January to mid-March, the cold season lasts from end of June to end of August, when rainfall is frequently accompanied by thunderstorms. The city is bordered by thick tropical rainforests along the river banks. Several of its neighborhoods are in low-lying areas prone to recurrent floods.

The average annual temperature is 26°C (78.7°F). Average monthly temperatures may vary by 2.5°C (4.5°F). This indicates that the continental type is hyperoceanic, subtype extremely hyperoceanic. Total annual precipitations averages 1,560 mm (61.4 inches) which is equivalent to 1,560 litres/m² (38.26 Gallons/ft²). On average there are 2,098 hours of sunshine per year.

¹¹ Köppen-Geiger classification: Aw

Figure 1: Monthly breakdown of humidity and precipitation levels



Source: ClimaTemps.com

Impact of temperature change in Bangui

Since Bangui is situated in a top tropic zone with a dry winter, the highest temperature in a year is relatively more significant than in non-tropical zones. The lowest temperature in Bangui is not quite special. According to climate archives, the average monthly maximal daytime temperature in Bangui varies from 29°C to 34°C within the year. The monthly average night minimum temperature varies from 19°C to 21°C in a year.

Figure 2: Monthly breakdown of several climate variables

| Climate Variable | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|--------------|
| <u>Average Max Temperature</u> °C (°F) | 33 (91) | 34 (93) | 33 (91) | 33 (91) | 32 (90) | 31 (88) | 29 (84) | 30 (86) | 31 (88) | 31 (88) | 31 (88) | 32 (90) | 32 (89) |
| <u>Average Temperature</u> °C (°F) | 27 (80) | 27 (81) | 27 (81) | 27 (81) | 27 (80) | 26 (79) | 25 (76) | 25 (77) | 26 (78) | 26 (78) | 26 (78) | 26 (78) | 26 (79) |
| <u>Average Min Temperature</u> °C (°F) | 20 (68) | 20 (68) | 21 (70) | 21 (70) | 21 (70) | 21 (70) | 20 (68) | 20 (68) | 20 (68) | 20 (68) | 20 (68) | 19 (66) | 20 (68) |
| <u>Average Precipitation mm</u> (in) | 21 (1) | 47 (2) | 124 (5) | 128 (5) | 173 (7) | 135 (5) | 185 (7) | 225 (9) | 185 (7) | 202 (8) | 101 (4) | 34 (1) | 1560 (61) |
| <u>Number of Wet Days</u> (probability of rain on a day) | 2 (6%) | 5 (18%) | 9 (29%) | 10 (33%) | 14 (45%) | 12 (40%) | 14 (45%) | 17 (55%) | 16 (53%) | 17 (55%) | 10 (33%) | 3 (10%) | 129 (35%) |
| <u>Average Sunlight Hours/Day</u> | 06:32 | 07:06 | 06:09 | 06:08 | 06:13 | 05:16 | 04:27 | 04:27 | 04:46 | 05:05 | 05:42 | 07:05 | 05:44 |
| <u>Average Daylight Hours & Minutes/Day</u> | 11h 53' | 11h 58' | 12h 05' | 12h 12' | 12h 18' | 12h 22' | 12h 20' | 12h 15' | 12h 08' | 12h 00' | 11h 54' | 11h 51' | 12h 00' |
| <u>Percentage of Sunny (Cloudy) Daylight Hours</u> | 56 (44) | 60 (40) | 51 (49) | 51 (49) | 51 (49) | 43 (57) | 36 (64) | 37 (63) | 40 (60) | 43 (57) | 48 (52) | 60 (40) | 48 (52) |
| <u>Sun altitude at solar noon on the 21st day (°)</u> | 65.6 | 74.7 | 85.5 | 82.5 | 74.2 | 71 | 73.9 | 82.3 | 85.9 | 74.4 | 65.4 | 62.2 | 74.8 |

Source: ClimaTemps.com

Without taking into account climate change, the maximal temperature in Bangui is already very high. With a maximal daytime temperature of 34°C, the extreme high temperature can be 39°C, 40°C or even more. But,

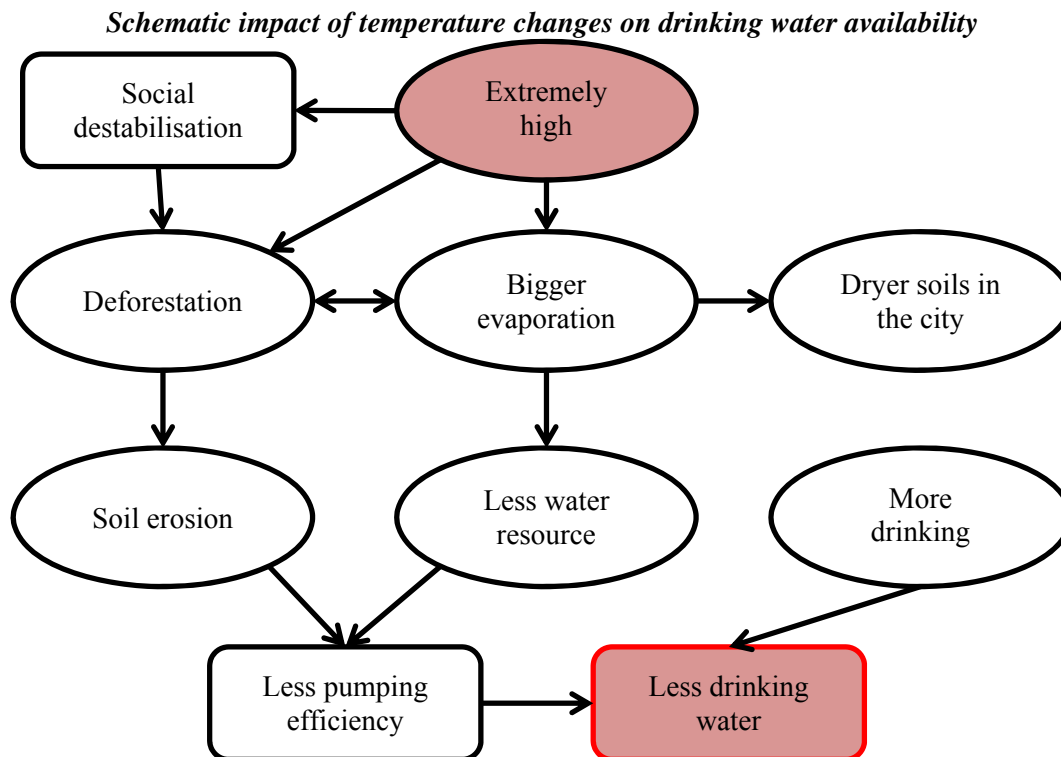
accounting for a moderate perspective of climate change impact, the max temperature in Bangui can increase up to 37°C. Hence an extremely high temperature of more than 40 °C could become a very usual situation.

Vulnerability and Consequence

Dryness and more water loss in the network: CAR is situated not far from the equator, the average temperature and extreme high temperature are already considerable very high. In the climate change scenario, the average maximum daytime temperature will increase up to 39°C - 40°C. This phenomenon will make the soil dryer during hot days. Nowadays, the soil of Bangui is already very dry. The flying dusk in the city is sometime phenomenal. Dry soils facilitate drinking water leakage from its canalization. Considering that the current leakage rate is beyond 70%, the extreme leakage case in the climate change scenario could reach 90%. In some corners of the canalisation, drinking water will not be delivered at all.

Less water in river, aquifer and springs: The extremely high temperatures will cause natural irritation problems for the forest and other vegetation. Some vegetation can even perish in large quantities because of the harsh weather. Once the vegetation shrinks, the evaporation will be considerably more important than in the business-as-usual scenario. Water in the biosphere will evaporate into the atmosphere. The precipitations can also increase due to the higher evaporation in a short time. In the long term, water in both atmosphere and biosphere will be lost faster and faster. The average precipitations quantity will decrease considerably in the climate change scenario; with quantity of water in all natural containers decreasing accordingly.

Social destabilisation and deforestation: Deforestation and social destabilization facilitate the development of each other within a very ill-fated circle. The habitants are not well skilled in agriculture life. Their lives are preponderantly depending on the livestock of wild forest and savannah vegetation. The destruction of vegetation will therefore bring severe consequences to the local societies. Chaos situation of the society will in turn foster illegal wood business, illegal mining and other deforestation activities.

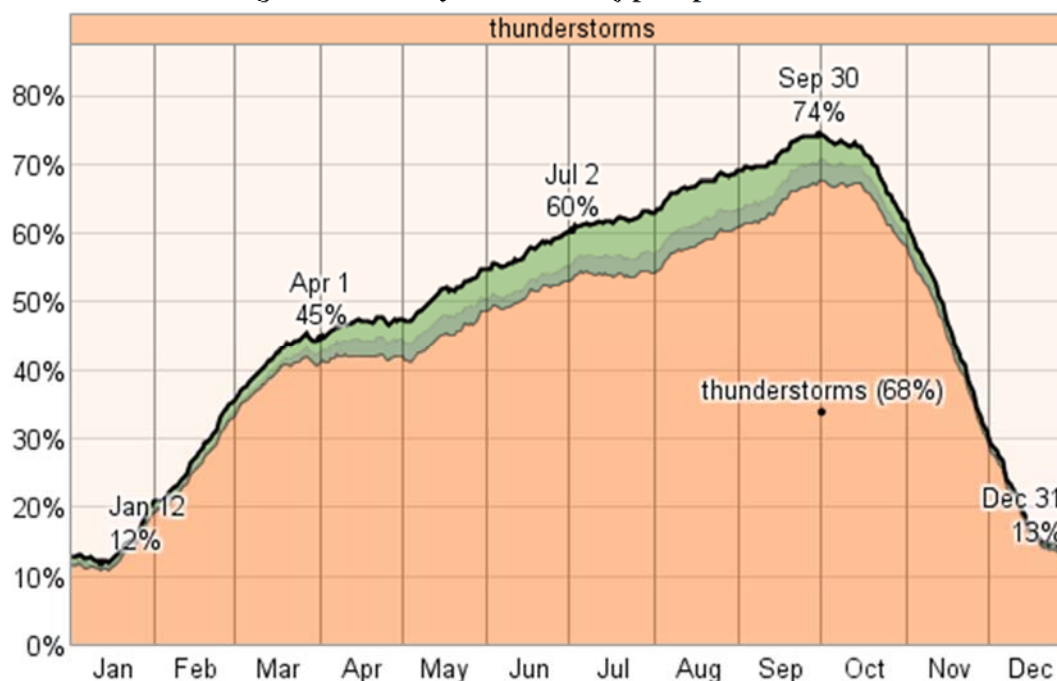


Source: Carbonium

Impact of precipitation change

The weather in the city of Bangui is relatively wet. The probability that precipitation will be observed at this location varies throughout the year. Precipitations are most likely around September 30, occurring in 74% of days. Precipitations are least likely around January 12, occurring in 12% of days.

Figure 3: Monthly breakdown of precipitation likelihood



Source: WeatherSpark

The precipitation types in Bangui are variable. If more than one type of precipitation is reported in a given day, the most severe form of precipitation is counted. For example, if light rain is observed in the same day as a thunderstorm, that day counts in the thunderstorms total. The order of severity is from the top down in the above figure, with the most severe at the bottom. Over the entire year, the most common form of precipitation is thunderstorm.

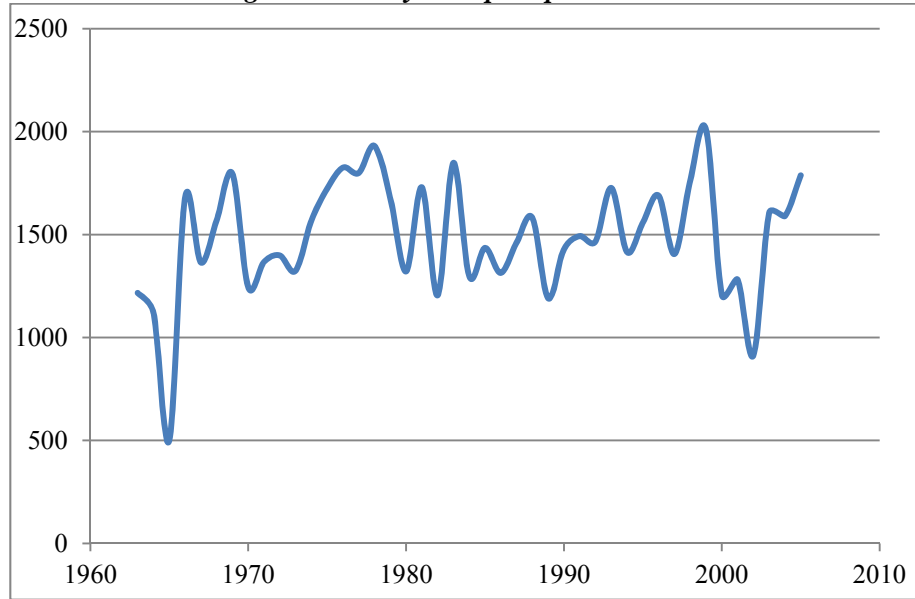
Thunderstorms are the most severe precipitation, observed during 90% of those days with precipitation. They are most likely around October 1, when it is observed during 68% of all days. During the warm season, which lasts from January 23 to March 18, there is a 29% average chance that precipitations will be observed at some point during a given day. When precipitations do occur, it is most often in the form of thunderstorms (93% of days with precipitation have thunderstorms).

During the cold season, which lasts from June 20 to August 27, there is a 63% average chance that precipitations will be observed at some point during a given day. When precipitations do occur, it is again most often in the form of thunderstorms (87% of days with precipitation have thunderstorms) and light rain (8%).

The monthly average precipitation in Bangui is also well recorded in meteorology stations. The annual precipitation quantity in the city varies significantly. In the recorded driest year, 1965, the annual total precipitation quantity was only of 500 mm. Anyway, researchers doubt the records of this year to be credible. Another year with extremely dry weather was 2002, with an annual total precipitation record of 912 mm.

In the wettest years, the annual precipitation can reach 1,900 mm and even more.

Figure 4: Yearly total precipitation levels



Source: WeatherSpark

In the climate change scenario, precipitations in a specific zone could be violent, especially in tropical areas. Extreme weather situation will be more likely. With an already significant precipitation quantity nowadays, Bangui is quite vulnerable for flood in the wet climate change scenario. On the other hand, Bangui will suffer from arid periods with very little precipitation.

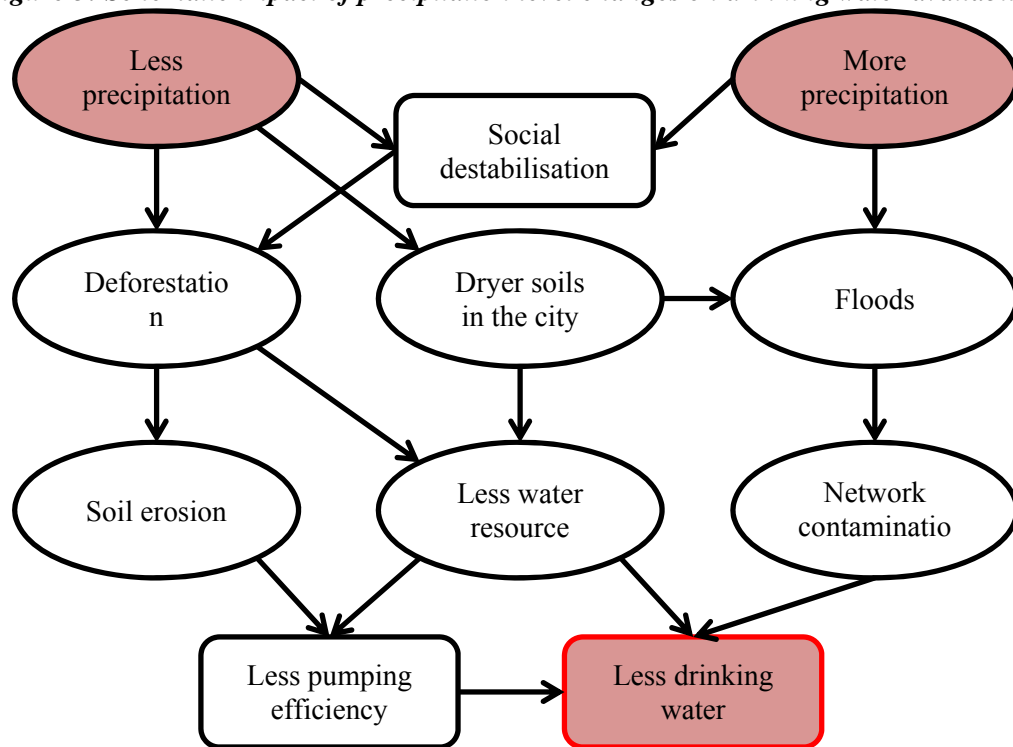
Vulnerability and Consequence

Flood and contamination of drinking water network: Large quantities of precipitations can cause severe flooding in the city of Bangui. The floods will activate the pollutions in the soil. Since the drinking water canalization in Bangui has plenty of leakages, the pollution desolated in the flood can very possibly contaminate the drinking water network, which could eventually paralyze the whole underground water transportation system.

Less water in river, aquifer and springs: Arid weather will cause natural irritation problems for the forest and other vegetation. Some vegetation can even perish in large quantity depending on the harshness of the weather. Once the vegetation shrinks, the evaporation will be considerably more important than in the business-as-usual scenario. Water in the biosphere will evaporate into the atmosphere. The average precipitations quantity will decrease considerably in the climate change scenario; quantity of water in all natural containers will decrease accordingly.

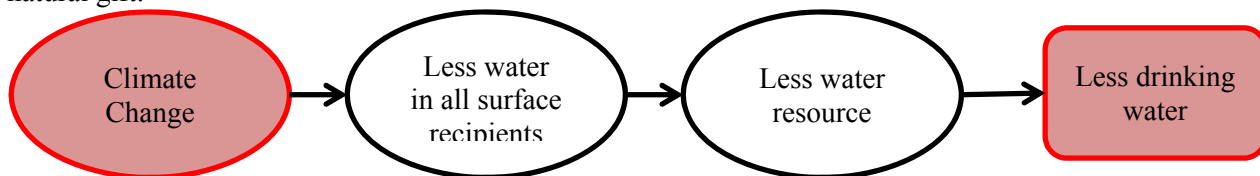
Social destabilization and deforestation: Very dry or very wet weather can be previewed as a kind of intrigue for social destabilization and deforestation.

Figure 5: Schematic impact of precipitation level changes on drinking water availability



Source: Carbonium

Water quantity of springs in CAR: Climate Change is causing more and more loss in all natural water resources in tropical areas, even with extremely important precipitations peak. The springs in CAR are a kind of resource of drinking water for very few people. Further studies will be necessary to determine how to better value this precise natural gift.



Source: Carbonium

Impact of deforestation

The tropical forest in Central Africa is a real treasure for the country and equally precious for the whole planet. Unfortunately, the extreme poverty and the social conflicts have rendered the environment protection management and protection powerless. The human immigration caused by the dryness of Chad Basin made a burgeoning population growth in the forest zone. The entire inhabitants' inefficient agricultural practices are causing large-scale destruction of tropical rainforests in Central Africa. KU Leuven University has sent a group of researchers to exam how these practices will affect longer-term temperatures in the region. Using a sophisticated computer model, they forecasted Congo Basin temperatures anno 2050. One of the main conclusions is that, in 2050, Central Africa will be on average 1.4°C hotter than nowadays as a result of global greenhouse gas emissions. Deforestation will add an extra 0.7°C to that figure.

Their results also show a strong spatial correlation between deforestation and global warming. In certain deforestation 'hot spots', increases caused by deforestation could rise to 1.25°C, in addition to the warming caused

by greenhouse gases. Such drastic temperature increases will drive off plant and animal species and may even threaten some with extinction, warn the researchers.

The researchers used an advanced computer model based on realistic projections of the speed and the spatial pattern of deforestation to forecast changes in the Congo Basin climate. The study also maps the region's vegetation mix – which has largely replaced felled rainforest in much of the region – for the first time.

The deforestation-induced warming forecasted by the model can be attributed in large part to reduced evaporation, say the researchers. Once deforestation has occurred, the solar energy that rainforests would otherwise use to evaporate water accumulates near the Earth's surface, causing the atmosphere to warm.

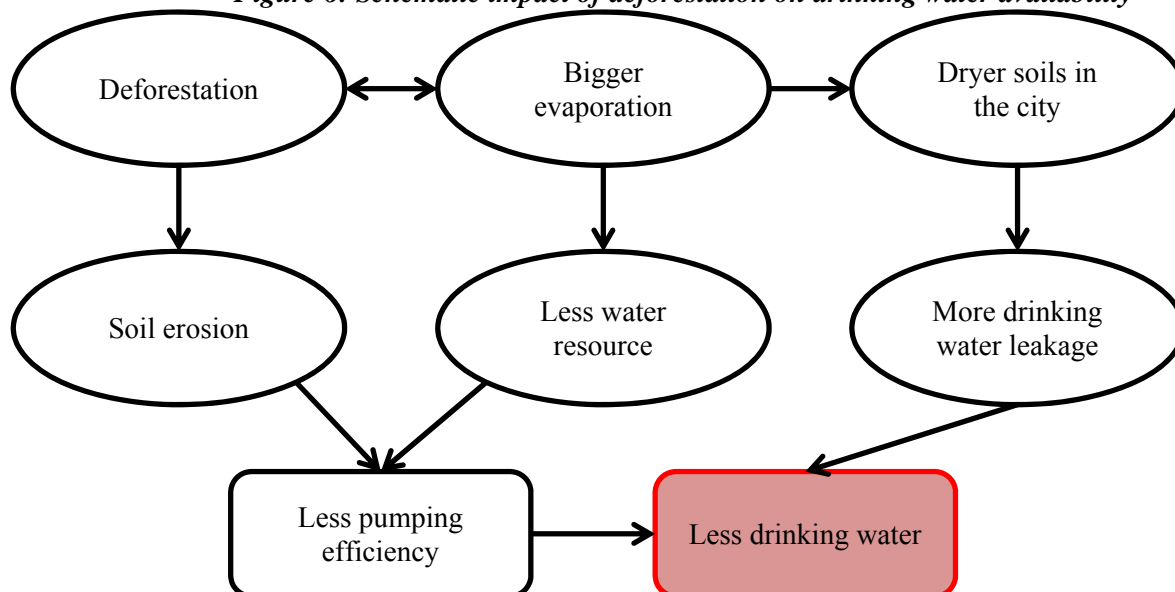
This reduced evaporation also threatens precipitations levels in the region, the study predicts. However, because of the complexities of air circulation and cloud formation, the link between spatial pattern of change and deforestation is less pronounced. Generally speaking, not only does deforestation in this region contribute to the global rise in temperature through CO2 emissions from wood burning, it also has a direct impact on the climate of Central Africa.

Vulnerability and Consequence

Soil Erosion: the first important consequence of deforestation is soil erosion. The forest, with its accessory vegetation, is one of the best natural mechanisms to stabilize soil in the biosphere. The roots of the vegetation can stabilize the soil and water contents at the same time. Once the forest disappears, both soil and water will start destabilizing. Water contents will vanish into the atmosphere, while soils will be eroded and brought into rivers by surface water flow. The destabilization of soil and deforestation impact one another until a very negative degradation cycle. The river bed of Ubangi received more and more soil and sand following the development of deforestation in the region.

Destabilization of underground water: the vegetation on Earth can protect the soil from heavy solar radiation, helping water molecule to stay in the soil without being evaporated into the atmosphere. The very fine tips of the vegetation rhizine system can also keep a part of liquid water in the soil.

Figure 6: Schematic impact of deforestation on drinking water availability



Source: Carbonium

Summary of problems and threats caused by climate change

| Climate Change Facts | Environmental Impacts | Social Impacts | Impacts on water supply chain | Consequences |
|--|---|---|--|--|
| Dryness of Chad basin | - Grassland shrinks - Deforestation - Less surface and underground water - Cattle immigration from Chad basin to Congo basin | - Conflicts between habitants of two basin - Human immigration - Deforestation - Project water transportation from Ubangi to Chad Lake | - More sand in the river - Less water in the river - Less spring water - Less underground water | - Pump station blocked by sand in the river - Less raw water for all measurements of water supply |
| Extreme high / low quantity of precipitation | - Flood - Dryness | -Social instability -Lack of water in worse degree | - Pollution infiltration into drinking water network by leakages - More loss by network leakage | -Polluted drinking water -Less drinking water available |
| Extreme high / low temperature | - Deforestation - Less surface and underground water | - Conflicts between habitants of two basin - Human immigration -Deforestation | - More sand in the river - Less water in the river - Less spring water - Less underground water - More loss by network leakage | - Pump station blocked by sand in the river - Less raw water for all measurements of water supply |

Source: Carbonium

The environment problems caused by climate change, and concerning climate change, in Bangui shall be previewed. Solution shall also be available to reduce the vulnerability.

| Problems | Solutions |
|---|--|
| Pump station blocked by sand in the river | <ul style="list-style-type: none"> • Renew the pumping station • Construct a new pumping station |
| Less raw water for all measurements of water supply | <ul style="list-style-type: none"> • Alternative water supply solutions |
| Polluted drinking water | <ul style="list-style-type: none"> • Renew the drinking water distribution canalization |
| Less drinking water | <ul style="list-style-type: none"> • New drinking water plant • Renew the drinking water distribution canalization |

Source: Carbonium

Existing Facilities and Service in Bangui

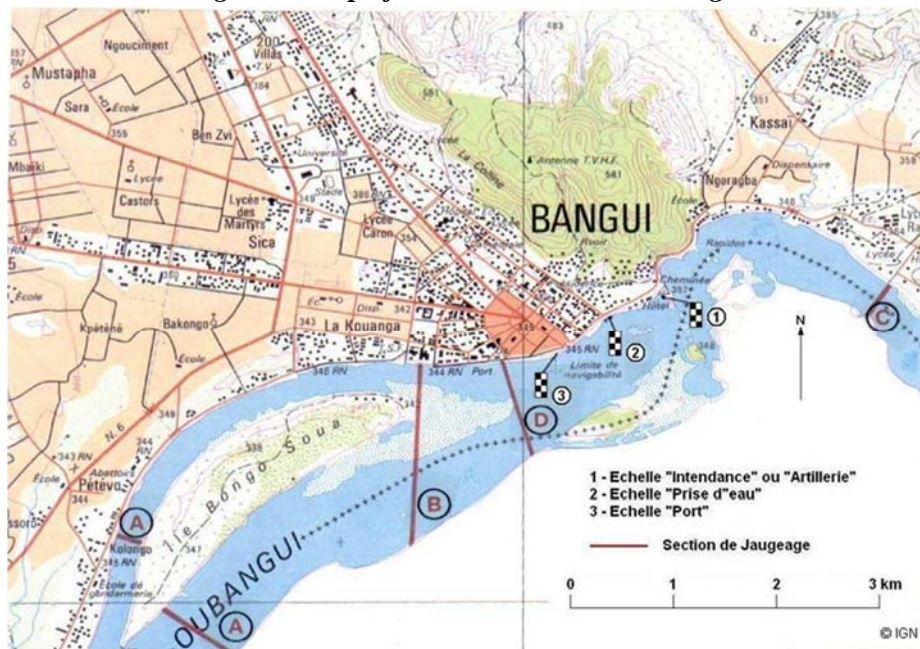
- Bangui: 1 main pumping station
- Bangui: 1 drinking water production plant
- Bangui: 3 intermediary pumping stations
- Bangui: 5 reservoirs
- Bangui: 393 km of canalisation for drinking water distribution
- Bangui: Water kiosks
- Bangui: Cistern trucks
- Suburb Bangui: Boreholes with or without emerging pump
- Suburb Bangui: VIP toilet

Pumping station: The SODECA pumping station is located on the river bank of the Ubangi. A retention basin is supplied by a group of pumps (1+1 stand-by 1500 m³/h, 28kW) in the dry season. During the wet season, the retention basin is connected to Ubangi river water directly. 5 pumps, 500-510 m³/h each, are supporting the drinking water treatment plant from the retention basin with a mechanism of 3+2 stand-by while being powered by ENERCA grid and 2+3 stand-by when powered by local electricity generator. The pumping point is protected by screens and equipped with chloric anti-septic dosing system. This facility was built in 1963.

Drinking water production plant: The only drinking water production plant in Bangui is the very core propriety of SODECA. The plant is composed by two treatment unit, which totally make a production capacity of 1500m³ per hour. The first treatment unit, with production capacity of 900 m³/h was built in 1963. The second treatment unit, with production capacity of 600 m³/h was built in 1976. Both of those treatment units are designed with traditional flocculation, decantation and filtration technology. The facility is operational but without necessary systematically maintenance and monitoring. A comprehensive management procedure with analytic equipment and IT support shall be considered as a necessary expectation for further amelioration.

Intermediary pumping stations: Three intermediary pumping stations are deployed since the beginning of operation in order to distribute drinking water to the reservoirs.

Figure 7: Map of the water network in Bangui



Reservoirs: The 5 existing reservoirs can contain 13,800 m³ water, allowing for a 9 hours use. Those reservoirs are deployed in various corners of the city. They were built 30-50 years ago and are still operational but lack regular hygiene evaluation, maintenance and cleaning.

Network of distribution: The length of the existing network reaches 393 km according to municipal documentation. It is recorded that the primary network (DN 100- DN 600) accounts for 43% of the total canalization, while the secondary network (DN60- DN 90) represents 56% and third level pipes (DN 30 – DN 50), only 1%.

The drinking water distribution network in Bangui was made from various materials. 79% of pipelines are made of PVC and 19% are made of cement containing asbestos. The pipelines in Bangui for drinking water distribution are very old from 23 to 80 years.

Unfortunately, obsolescence is not the only problem for the drinking water distribution network. Leakages and illegal connections are also detrimental to the city's normal life. SODECA lose more than 70% of production via leakages and illegal connections.

Water kiosks: Small water selling kiosks are deployed by SODECA dispersedly in the city of Bangui. Each kiosk is connected to the water distribution network. Three water taps are equipped in each kiosk for selling water to multiple clients. Each cubic meter of drinking water is priced at 500 FCFA, approximately one US dollar.

Figure 8: Pictures of a water kiosk



Boreholes with or without emerging pump: The National Agency of Water and Sanitation (ANEA - *Agence Nationale de l'Eau et de l'Assainissement*) is a governmental administration for drinking water and hygiene management in the rural or semi-rural area in the Central Africa Republic. ANEA is trying to compile measurements to make drinking water available for habitants in the targeted zones.

ANEA normally creates one water point (a well with simple manual pump system) available for around 300 inhabitants. Meanwhile, a water supply unity (a well, an electrical pump, a cistern and a chloride injection system) covers 1,500 inhabitants. It is therefore built for agglomerations of more than 1,500 inhabitants. About 33% of the population is supplied in drinking water in rural areas.

VIP toilet systems (modern latrines / toilets): Making this toilet system available in the rural area is one of the biggest efforts that ANEA has made for years. VIP toilets are widely employed as sanitation solution in rural areas. VIP systems need to be emptied and cleaned every two years in public place (school, petrol station, church etc.) and every five years for families. Currently, less than 10% of the population in the rural area has access to VIP sanitary systems.