

## A. Project Overview

The Cotonou Stormwater Management and Urban Resilience Project (CSMURP) is an initiative of the Government of Benin that aims to improve the living conditions of the population through optimal drainage of stormwater, one of the main problems that has persisted for decades.

The specific objectives of the project include: i) building collectors in about ten boroughs in Cotonou, ii) developing retention basins in swampy areas, especially in the western part of the city, iii) building streets adjacent to the collectors and retention basins, iv) rehabilitating some social and community infrastructure in some basins.

The CSMURP consists of the construction of a drainage system, including stormwater retention ponds, across 36 hydrographic sub-basins in the city. To improve sanitation and drainage in the adjacent neighborhoods, several converging streets have been selected for paving.

The analysis of project alternatives was completed using the mitigation hierarchy approach which was to avoid affecting human dwellings and installations (houses, shops, etc.) first, and then a least displacement whenever the avoidance is not efficient. Therefore, underground collectors, gutters and/or semi-closed gutters that can be centered or lateral were preferred on the one hand, and open-air trapezoidal collectors on the other. As for the installation of the collector outlets and the gutters, as well as the retention basins, the Reno mattress is retained to allow the stabilization of the banks/ slopes.

After analyzing the alternatives on the basis of technical, economic, social, and environmental criteria, the option of a paved road, the development of banks of basins into Reno mattresses, underground, centered, lateral, closed or semi-closed, depending on the case, was chosen, in order to minimize displacement for the residents.

In addition, track will be constructed around the basins, with facilities such as public benches, streetlights, latrines, playgrounds etc.

The construction of tracks around the basins will prevent any illegal settle-in, squatting or waste dumping, and facilitate mobility around the basins and their maintenance.

All these facilities will be built in the public easement, already reserved for this purpose.

The main activities essential to the realization of these works are among others:

- the company's facilities;
- stripping and depositing of rubble and materials;
- excavation work;
- the purging of 2,518,337 m<sup>3</sup> and the disposal of the dredged materials;
- the installation of compacted backfill;
- shoreline protection with Reno Mattresses;
- the construction of reinforced concrete sewerage works;
- earthworks for the development of roads;
- the laying of paving stones and development up to the residents;
- the construction of public benches and the installation of solar streetlights;
- the commissioning of the works and the maintenance of the works during the warranty period;
- The handing over of the works to the Contracting Authority after the guarantee period.

To carry out these activities, the contractors will employ more than 51,748 workers of various categories.

In accordance with the provisions of the Benin Environmental Framework Act No. 1998-03 of 12 February 1999 and its title 5, article 88: "No one may undertake developments or operations without following the environmental impact assessment procedure, when the latter is required by laws and regulations".

## **B. Project site description**

The project's receiving environment is Cotonou, Benin's metropolis and politico-economic capital city, located in the southern part of the country. The city enjoys a sub-equatorial climate under the influence of two dry seasons and two rainy seasons, driven by a pseudo "monsoon".

The city is built in the coastal sedimentary basin of Benin, in the marginal-littoral domain and has a morphology that is essentially based on a large coastal plain component whose lower, sandy, often marshy part nowhere exceeds 10 m in altitude (see map below). The spot heights vary between 1.02 and 6.52 m from null island (Gnélé, 2010). The average height for this entire section is 3.52 m. This relief is therefore not favorable to stormwater drainage. Rather, it is the source of stagnation and infiltration.

The geographical area of the CSMURP is composed of sandy-clay swamps, very close to floodplains on the one hand, and lake and lagoon banks on the other, which confirms that the city of Cotonou is located at the bottom of the entire topographical system of Benin's coastal sedimentary basin.

Apart from the climatic and geomorphological aspects, the Cotonou hydrographic network consists of Lake Nokoué (Ramsar site), the Cotonou lagoon and a dense network of swamps. The Atlantic Ocean is an integral part of this vast hydrological system which interconnects on the one hand, thus serving as a receptacle for the entire Cotonou platform on the other hand.

The city of Cotonou being highly urbanized, natural vegetation has almost completely disappeared due to human activities. Apart from the alignment and reforestation species and ornamental species, the swamps, which are the retention basins (to be developed) and outlets, are the very natural vegetation reserves rich in biodiversity.

There are formations such as: floating prairie, floodplain, swampy prairie and urban wasteland. More than twenty species have been identified, but none of them have the status of threatened species.

The most important ones are: *Eichhornia crassipes*, *Paspalum vaginatum*, *Typha domingensis*, *Terminalia catapa*, *Kyllinga peruviana*, *Canavalia rosea*, *Costus spicatus*, *Thalia geniculata*, *Musa sp*, *Carica papaya* and *Ny*

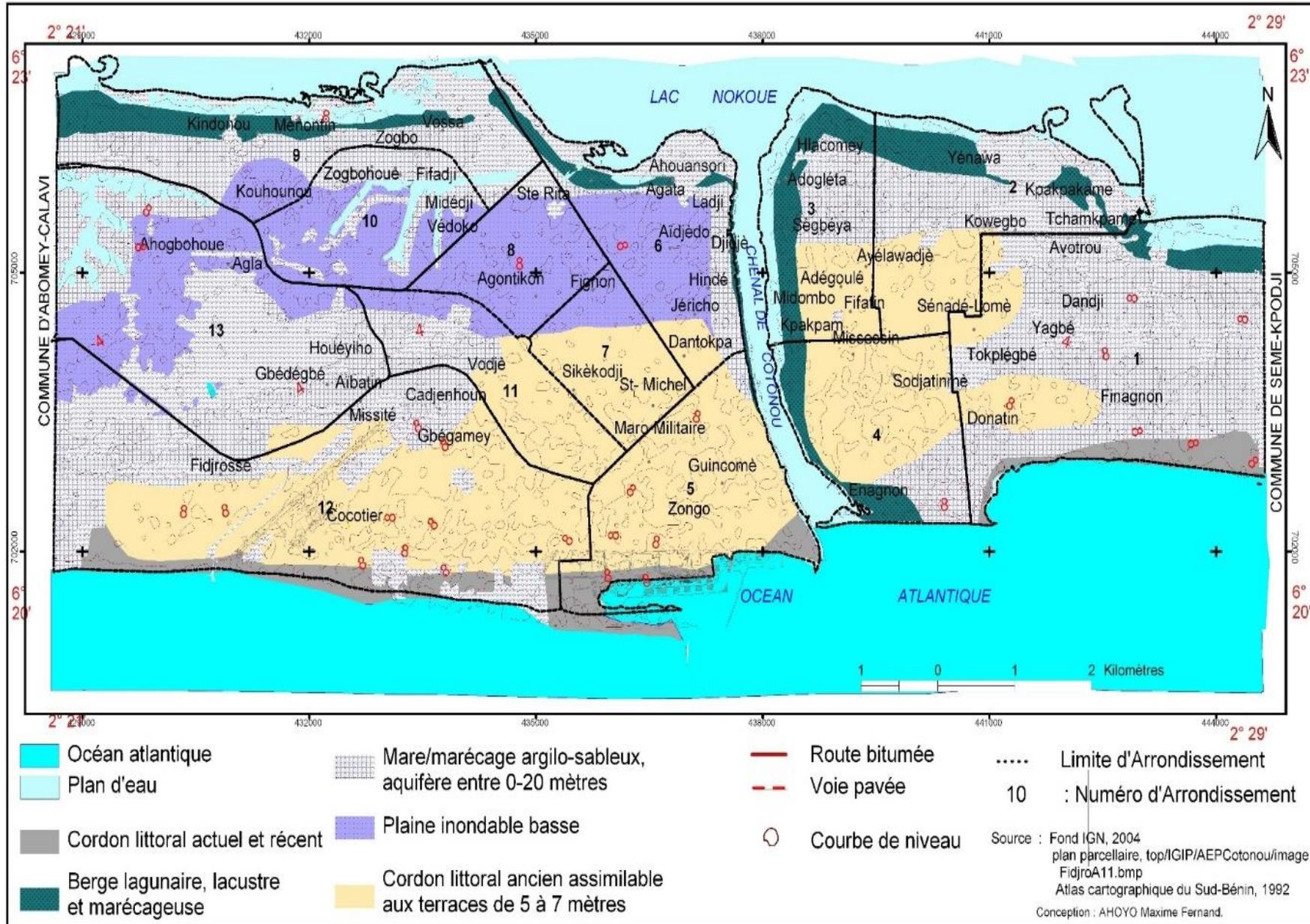
*mphea lotus* which float on the surface of the water. There are also *Phyla nodifolia*, *Pentodon pentandrus*, *hyptissuaveolens*, and some poaceae of the genera *Eragrostis*, *Panicum* and *Dactyloctenium* etc.

These species are valued by local populations either for traditional medicine, as useful plants or for aphrodisiac products.

With regard to land use (next map), the city faces real problems of spatial organization, sanitation and hygiene, which, combined with high population pressures, lead to the occupation of areas that cannot be built upon and are permanently flooded.

Thus, the outfalls and swamps of Cotonou, which play decisive and very important roles in the regulation and functioning of the system: land outfalls-lagoons/lake/ocean are increasingly congested by human activities, illegal landfills, etc.

Figure 1: Topographic map of the city of Cotonou



This hinders stormwater flow, with the negative consequences of flooding and its corollaries on public health. To address this situation, which damages the image of the economic capital, the Government has entered into negotiations with the TFPs to support the government in the process of continuous improvement of the living environment of populations already facing myriad challenges in the household waste and wastewater management, leading to a proliferation of diseases such as malaria, diarrhea, and respiratory infections, etc. The Government of Benin has therefore taken the very right decision in making the CSMURP a priority.

The main challenges identified or even highlighted by the populations are mainly of a social nature, particularly land, fair and prior compensation, the safety of people and property, access to housing, various types of nuisances, compliance with construction deadlines, and the recruitment of local workers. It should be noted that, although located in flood-prone areas, prohibited for human habitation, most owners require compensation before any work can begin.

The involuntary displacement of informal occupants of the public easement is also a major concern reported and addressed by the GAP.

As concern natural resources, the issues are focused on Lake Nokoué and wetlands (receptacles of drained water), which are ecosystems rich in biological diversity on the one hand, and sites protected by the Ramsar Convention on the other.

### **C. Political, legal, and institutional framework of the project**

Benin has adopted several strategic policy documents related to the issue of stormwater management and the sanitation of the population's living environment. These include: a) the National Hygiene and Sanitation Policy (NHSP) document; b) the National Strategy for the Promotion of Hygiene and Sanitation (NSPHB) in rural and semi-urban areas; c) the National Water Policy Document; d) the National Waste Management Strategy; f) the National Disaster Prevention and Integrated Management Policy.

In light of the scattered nature of the consideration of floods in these various documents and to better frame the problem related to this issue, a Contingency Plan has been drawn up under the aegis of the National Civil Protection Agency (NACP), for municipalities at high risk of flooding, including the municipality of Cotonou.

These strategy documents provide guidelines to be followed in the relevant areas and are supported by international and national laws and regulations.

At the international level, these are the agreements and conventions signed and ratified by Benin, of which the Ramsar Convention, the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity are the most relevant to this project.

The CSMURP will be carried out in the East Complex of the Ramsar 1018 site, which includes the lower Ouémé valley, the Porto Novo lagoon and Lake Nokoué. The designation of this ecosystem as a "Ramsar site" was based on specific criteria, including the international importance of the area and the presence of water birds in all seasons. The funding of the CSMURP is provided by several financial partners including the World Bank, the West African Development Bank (WADB), the African Development Bank (ADB), the Islamic Development Bank (IDB), the French Development Agency (FDA).

As the World Bank is the lead agency for the panel of TFPs, its operational policies were applied for the implementation of the ESIA. These are OP 4.01 Environmental Assessment, OP 4.04 Natural Habitats, and OP 4.11. Physical Cultural Resources; OP 17.50 Information Dissemination.

OP 4.12 Involuntary Resettlement is applicable for the implementation of Action and Resettlement Plans.

Figure 2: Land-use map of the city of Cotonou

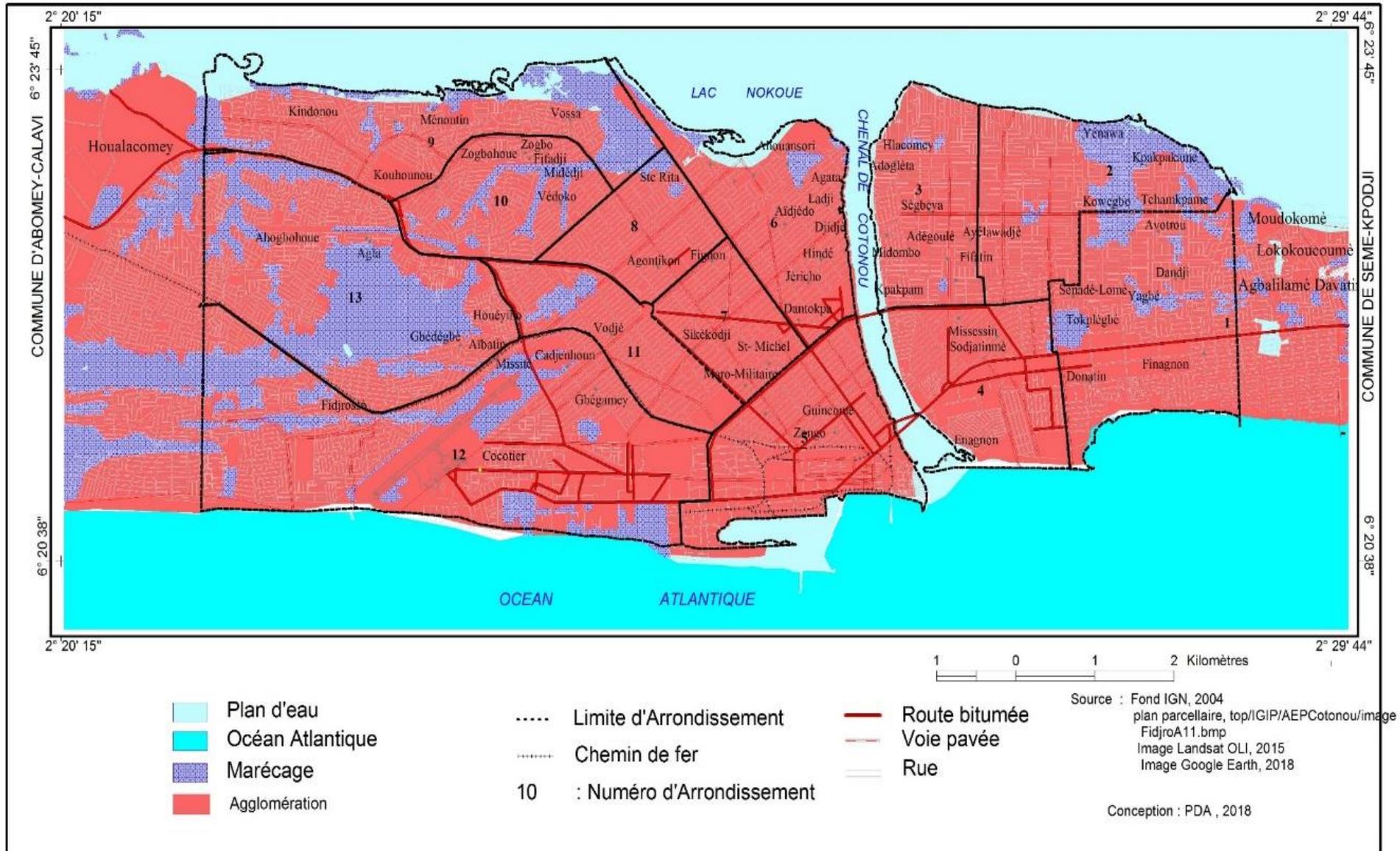
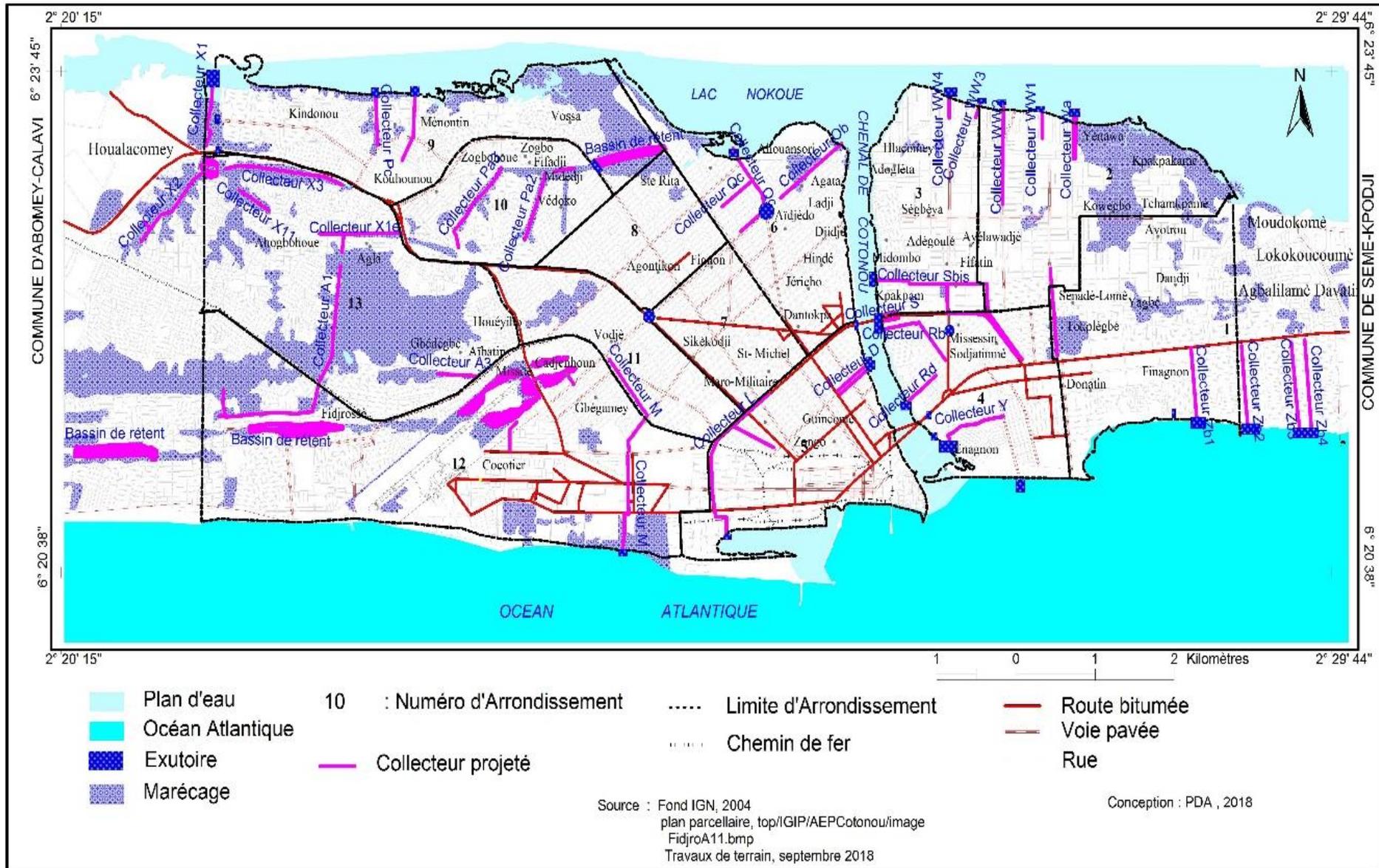


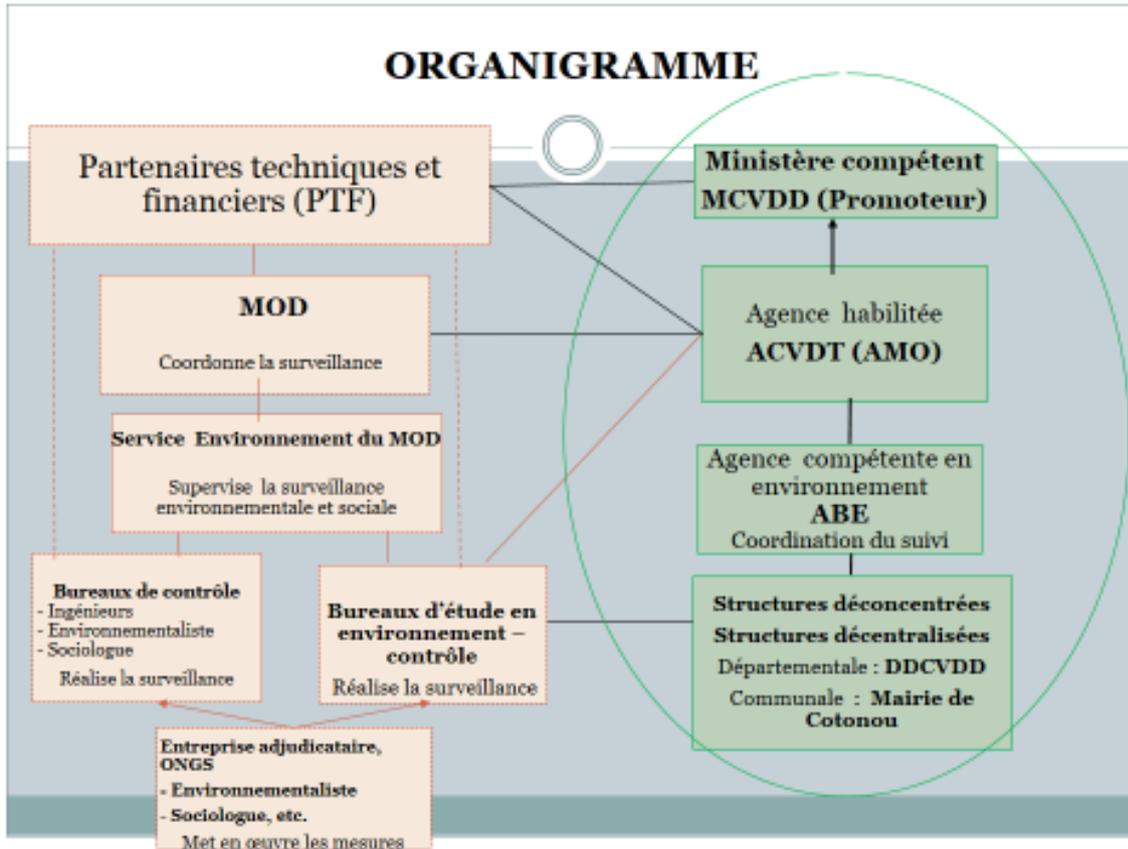
Figure 3: Overlay map of the city of Cotonou



At the national level, several legislative and regulatory texts are applicable to the present project, including: (a) Act No. 98-030 of 12 February 1999 on the blueprint law on the environment in the Republic of Benin; (b) Act No. 97-029 of 15 January 1999 on the organization of municipalities in the Republic of Benin; (c) Act on the Public Health Code, supplemented by its implementing decree No. 097-616 of 18 December 1987 on the Public Health Code, etc. The institutional framework for the implementation of the Project essentially includes:

- **The Ministry of Environment and Sustainable Development (MESD)**, which is the project Manager. The MESD has delegated the management of the CSMURP to the Agency for Living Conditions and Territory Development of (ALCTD). It ensures the technical coordination of the project and will also ensure the effective consideration and implementation of measures in order to mitigate environmental and social impacts during the implementation of the project;
- **Agency for the Execution of Urban Works (AGETUR)**: it will ensure the delegated Project Owner (PO) for the execution of ESIA and RAP studies.
- **Benin Environment Agency (BEA)**: will review and approve this Environmental and Social Impact Assessment and will also participate in the external monitoring of the implementation of the ESMP;
- **the MESD's Decentralized Technical Services**, chiefly the General Directorate for Environment and Climate, and the Departmental Directorate for Living Environment and Sustainable Development of Littoral (DDLESD), will contribute to the implementation of the ESMP.
- **the Technical services of the City Hall of Cotonou**, the municipality hosting the project activities, NGOs and active associations in the municipality will also be involved in monitoring the implementation of the ESMP during and after the implementation of the activity. The works carried out will be the property of the City Hall of Cotonou, which will be the manager after the official handover. Its responsibility is engaged with regard to the periodic maintenance of the works.
- **the contractors/suppliers (Control, surveillance, and execution of the work)**: they are responsible, through their Environmental Experts, for the implementation of the ESMP's obligations on the site;
- **NGOs**: In addition to social mobilization, they will participate in raising awareness among the population and monitoring the implementation of ESMP obligations through the involvement of the main actors involved in the implementation of activities;
- **Technical and Financial Partners (TFPs)** will have a right to environmental and social monitoring, in accordance with World Bank guidelines. Among the TFPs, apart from the World Bank, are the WABD, the ADB, the IDB, the EIB and the FDA.

Figure 4 : ESMP Implementation Flowchart



#### D. Impacts related to the project's activities

Positive and negative impacts were identified across the different phases of the project.

##### Potential positive physico-biological impacts

- the ease with which stormwater can flow;
- eradication of dumps and rehabilitation of outfalls and retention basins (remove waste, clear the right-of-way from outfalls, etc.);
- the sanitation of the city.

##### Potential positive socio-environmental impacts of wastewater facility construction

- Activities are almost similar on most collectors and retention basins. This refers to the involuntary displacement of persons installed in the public right-of-way where the facilities will be installed and must transfer the premises.
- It also includes civil engineering works leading to the construction/development of gutters, collectors and retention basins.
- The activities are described in the first part of this summary.

The potential positive impacts are:

- Creation of 51,748 jobs;
- Increase in the turnover of companies involved in the supply of materials and equipment;
- Possibilities for residents to use the rubble to fill in flooded streets and houses;
- opportunities for NGOs involved in solid and liquid waste management;
- improvement of human mobility;
- reduction of floods;
- reduction of diseases related to water, floods and insalubrious conditions;

- improving school attendance by schoolchildren and health centers;
- improving school performance;
- market animation in all seasons;
- better conditions for the movement of the sick, pregnant women, and the disabled.
- availability of leisure and rest areas for residents and populations;
- development of related activities;
- etc.

The following table shows the number of people who will benefit from sanitation and drainage by borough concerned.

**Tableau 1 : Beneficiaries by Borough of the CSMURP**

<b>Locations</b>	<b>2018</b>	<b>CSMURP basins / works</b>
Cotonou	990 775	-
1 <sup>st</sup> borough	84 575	Zb1, Zb2, Zb3, Zb4
2 <sup>nd</sup> borough	89 982	Wa, WW1, WW2 WW3, Wab
3 <sup>rd</sup> borough	102 127	S, Sbis, WW4 and Rabis
4 <sup>th</sup> borough	53 050	Y, Ra, Rc, Rd and Rabis
5 <sup>th</sup> borough	29 240	D and L
6 <sup>th</sup> borough	42 805	Qc and Qb
9 <sup>th</sup> borough	84 179	Pb and Pc
10 <sup>th</sup> borough	56 510	Pa2 and Pa3
12 <sup>th</sup> borough	142 879	M, ABa, ABb, ABc, AAc and AAs
13 <sup>th</sup> borough	99 931	XX, X1, X2, X3 X11 and AAN
<b>Total number of people impacted</b>	<b>785 278</b>	

Through the CSMURP, it can be said that it is the whole city of Cotonou that will be impacted through general sanitation, focused on the efficient drainage of stormwater.

This will have a significant impact on the health of populations, not to mention the impacts on the landscape.

#### **Potential negative physico-biological impacts**

- Air quality impairment
- Noise pollution
- Disturbing vibrations
- Bustling and disturbance of aquatic fauna during cleaning and purging
- Disturbance of Avian Fauna Habitats at Outlets;
- Destruction of alignment trees, (1025 trees in the public domain) located in the right-of-way and vegetation located in retention basins and collector outlets;
- risks of waste and wastewater discharges into the developed basin.
- risks of quarry erosion due sandpits;
- etc

#### **Potential negative socio-environmental impacts of wastewater facility construction**

The various planned developments will result in significant negative impacts:

- *Impacts related to land*
  - 125 bare non-constructible bare lands will be taken into account in the displacement;
  - 63 dwellings are also affected by the displacement.
- *Installations in the public easement for economic activities.*  
There are 271 decks, 213 shacks, 228 ramps/stairs, 132 huts, 263 hangars, 30 kiosks, 197 mobile displays, 90 shops, to be moved.
- *Social and community facilities*

There are 71 sumps and pits, 12 toilets, 01 SBEE cabin, 01 SBEE transformer station, 05 electricity poles, 02 churches, 04 mosques, 01 temple and 01 school, to be moved.

Apart from the quantitative aspects, we can also mention:

- the temporary interruption of the economic activities of resellers installed in the vicinity of streets, gutters, collectors and retention basins to be developed with the temporary loss of revenue, the time required for resettlement and customer return;
- increase in the prevalence rate of STIs and HIV/AIDS (51,748 workers); mixing between populations and workers and a tendency to depravity even if the recruitment of local labor is recommended by local authorities and local residents.
- disruption of concessionaire networks (SBEE, SONEB, OPT) with the risk of loss of revenue, especially for bars and restaurants located along the roads to be developed.
- disruption of traffic and mobility in all areas of the CSMURP with a high risk of accidents and urban traffic jams/blocks, especially in the key centers of Cotonou.
- the risk of occupational accidents for workers (failure to comply with safety measures)
- The destruction of the vegetation at the outlets and basins;
- Soil congestion and pollution by purge/cleaning sludge from basins, outfalls and gutters, approximately 2,518,337 m<sup>3</sup> will be extracted to facilitate water flow at the outfalls.

Apart from the impacts, the risks identified are mainly related to the construction phase and in connection with civil engineering works. These are the risks of accidents during the various operations of the machines, the risks of accidents during the movement of people and goods, especially at the sites concerned with the construction sites and life camps. These risk levels range from medium to high for the most part.

It is also worth mentioning the risks of theft on car parks intended for the garage of vehicles from local residents to construction sites, as well as the risks of drowning during the cleaning of retention basins and outlets.

Excavation work is also exposed to risks, especially the risk of perforation of underground cables and the risk of destruction of possible physical cultural remains.

#### **E. Public consultations**

During the implementation of the ESIA, an important place was given to public consultation, which is a procedure for public participation in the decision-making process. Its objective is to inform the public concerned about the existence of a project and to obtain their opinion on the various aspects of its design and implementation.

In addition to the individual surveys at the borough concerned, public consultations were held as a group option (grouping of two 02 adjoining boroughs)

The optional grouped public consultations were held in the:

- 1st and 2nd boroughs, in the morning of Tuesday, February 20, 2018;
- 3rd and 4th boroughs, on the evening of Tuesday, February 20, 2018;
- 5th and 6th boroughs, in the morning of Thursday, February 22, 2018;
- 9th and 10th boroughs, in the evening of Thursday, February 22, 2018;
- 12th and 13th boroughs, in the morning of Friday, February 23, 2018.

These public consultations were held in collaboration with politico-administrative authorities. Mention should be made of the effective participation of local authorities and populations in these consultations because of their interest in the project.

The main concerns recorded during the sessions were:

- Notice (information) to affected people before demolition work;
- compensation of affected persons, including involuntary displacements;
- pollution problems and various nuisances;
- the recruitment of local workers;
- the targeting of leave and vacation period for the conduct of work in the vicinity of schools;
- the reconstruction of everything that would have been destroyed during the works;
- raising workers' awareness on bad behavior;
- user safety during the work;
- traffic difficulties during the work;
- the risks of accidents;
- the involvement of the town hall, local elected officials, and local populations (local residents' committee) to raise awareness and monitor the work;
- etc.

The list of interviewees and those of the public consultations are attached to this report.

#### **F. Environmental and social management plan**

To mitigate the potential negative impacts and improve the positive ones related to the implementation of the CSMURP and meet the expectations of the populations, measures have been proposed and compiled in the Environmental and Social Management Plan (ESMP).

The most important measures related to the remediation and construction of roads and facilities are:

- information sessions for the population on the progress of the work, possible network interruptions, useful measures to be taken and traffic instructions by a town crier and in the local press;
- the resettlement of people affected by the project ;
- the planning and minimization of possible interruptions of network concessionaires (SBEE, SONEB);
- the involvement of network concessionaires for due diligence in the relocation of networks;
- the construction and periodic maintenance of detour roads;
- the recruitment of local workers with equal competence;
- the provision of personal protective equipment (safety shoes, gloves, dust masks, vests, etc.) by the company to the personnel;
- the setting-up by the company of an IEC program against STIs, HIV/AIDS for construction site personnel and local populations;
- the planting of alignment trees on either side of all the arteries concerned by the project;
- the establishment in each district concerned of tree planting groups in schools and other public places to help capture greenhouse gases;
- the location of avian species before the destruction of vegetation at the outlets and the reinstallation of new habitats for avian fauna after the work;
- the setting-up of a communication system on the CSMURP;
- the setting-up of an environmental monitoring system for the project.

As part of the development of the CMURP activities, monitoring will consist in periodically carrying out an environmental assessment of the project. It will concern the evolution of certain impact receptors such as:

- air;
- water at outlets and basins;
- groundwater;
- soil;
- public health.

To this end, a capacity building plan has been drawn up taking into account the needs of the key actors involved in monitoring, in particular certain officials from the City of Cotonou, the Departmental Directorate of the Ministry in charge of the living environment, the Agency for the Living Environment for the Development of Territories, etc. BAE being the umbrella structure in charge of environmental monitoring in Benin.

To enable the implementation of the ESMP, environmental and social requirements have been defined. These requirements will be given to the companies for consideration during work.

The purpose of environmental site monitoring is to ensure compliance with the laws and regulations in force regarding environmental management and to apply the penalties as per the company's contract in the event of an infringement or non-compliance. Environmental monitoring also aims to ensure to the administrative authorities and the contracting authority that the mitigation, compensation and enhancement measures proposed in the ESMP are effectively implemented.

Some of these tools are:

- The internal regulations and the code of good conduct, which contain all the practical and respectful provisions of human rights, relating to general and permanent rules on discipline at work; the main measures relating to health and safety in the company; respect for human rights; respect for the environment; provisions relating to the protection of employees' rights; disciplinary measures; etc.
- The Health, Safety, and Environment Plan must be drawn up by the company in charge of the works and must specify its working methods and environmental protection. The organization within the company is also taken into account to meet all the requirements of the Project Owner (PO) regarding the environment. This document, which must be updated regularly, highlights the major environmental issues to be taken into account. It takes into account the Special Safety Plan and Health Protection (SSPHP), the Environmental and Social Site Management Plan (ESPM-S), and the Special Waste Management and Disposal Plan (SWMDP).
- The Guidelines for the Protection of Physical Cultural Resources, the objective of which is to safeguard all physical heritage during excavations, and the practical measures to be adopted.
- The Environmental and Social Clauses Booklet, which describes the environmental and social requirements during the construction phase, which are intended to inform the Contractor of his obligations regarding environmental protection, the safety of site personnel and the population, and the consideration of socio-economic aspects.

The requirements specify the content of the Environmental and Social Management Plan to be drawn up by the Contractor and the obligations for monitoring its implementation.

In light of the multitude of TFPs involved in the financing of the CSMURP, individual ESMPs have been developed, i. e. at basin level, to allow easy implementation. An ESMP matrix has been developed for each collector and retention basin that takes into account proposed measures, achievement indicators,

impact indicators, implementation schedules, monitoring managers, environmental monitoring managers, costs.

As an example, this summary presents an extract from the Pa3 collector ESMP matrix, specifically the work phase.

**Table 2: Excerpt from the ESMP of PA3 (work phase)**

2. Work and development phase						
2.1.N.1.2. ; 2.1.N.4.1. ; 2.2.N.6.1; 2.4.N.9.1. 2.7.N.2.1. 2.9.N.2.1. ; 2.15. N.1.1., Report and fence the base camp and the building sites	The Existence of a fence around the base camp The existence of sign posts and road signs for the base camp	Number of accidents	During the implementation of the building site and the base camp	PO, MdC the company in charge of the works	Cotonou city council PMU ALCTD	To be included in the conditions of the contract
2.1.N.1.1; Ensure the landscaper design fits the landscape of the receiving environment.	Existence of architectural plans that fit the landscape	Number of architectural plans designed in accordance with the requirements	Before the implementation of the base camp	PO MdC Company in charge of the works	Cotonou city council PO PMU ALCTD	5 000 000
2.1.P.1.1. Acquire skilfully the site (lease, purchase, etc.)	Existence of legal documents for acquisition or rental of sites (Proofs of purchase and other documents)	Absence of complaint	Before the construction of the base camp	The company in charge of the works MdC PO,	Cotonou city council PO	To be included in the conditions of the contract
2.1.P.1.2, 2.2.P.2.1., 2.3.P.2.2., 2.4.P.2.1., 2.8.P.2.1., Favor local workforce over any other kind in case it is as efficient as them	Number of local workers recruited	-Number of complaints registered and addressed -Number of local workers recruited	Before the works	PO, MdC The company in charge of the works	PO MdC Cotonou city council DDTFP	To be included in the conditions of the contract
2.3.P.2.3; 2.4.P.2.3; 2.8.P.2.2 Encourage female candidates	Female candidates are encouraged	Number of women recruited	During the recruitment phase	PO MdC Company in charge of the works	Cotonou city council DDTFP	To be included in the terms of the contract
2.1.N.2.1., 2.3.N.3.1., 2.4.N.2.1., 2.13.N.2.1., 2.2.N.9.1., 2.14.N.2.1. Sensitize the workers and the local residents living at the basin and the base camp to the	-Number of sensitization made -Number of new cases of HIV AIDS registered Number of condoms distributed	Number of complaints registered and addressed	During the construction works and the operation phase	Company in charge of the works MdC PO	Cotonou city council ABE ALCTD	To be included in the terms of the contract

STI-HIV/AIDS 2.14.N.2.2. Provide the workers with condoms						
2.14.N.2.3. Formulate a code of good practice within the company and have it signed by all employees of the company.	Existence of the Code of good practice signed by all employees of the company	Number of accidents noted	During the construction works of the base camp and others	Company in charge of the works, PO	Cotonou city council ALCTD DDCVDD Littoral	To be included in the conditions of the contract
2.1.P.2.1. , 2.3.P.2.1, 2.4.P.2.2. Recruit under the terms of (CNSS)	Every worker or beneficiary; CNSS office badge of every worker;	Number of complaints noted and addressed	During the recruitment of the workers	PO The company's control office	CNSS DDTFP	To be included into the ESMP of construction works and the environmental clauses
2.4 P.1.1. ; 2.4..N.3.2. ; 2.7.N.1.1. ; 2.1.N.3.2. ; 2.9.N.1.1. ; 2.10.N.1.1. ; 2.11.N.4.1; 2.12.N.1.1. ; 2.14..N.1.1; 2.14..N.3.2. ; 2.15.N.1.3 Provide and ensure that the workers wear their PPE	-Existence and effectiveness of PPE wearing -Stock of PPE available on the site	Number of injuries noted	During the construction works of the base camp and others	Company in charge of the works MdC PO	Cotonou city council ALCTD DDCVDD Littoral	To be included into the conditions of the contract
2.1.N.5.2 Comply with the standards on dust in Benin	Comply with the standards of dust emission Dust emission standards are complied with	Number of complaints related to dust emission noted and addressed	During the implementation of the base camp	Company's control office PO	Cotonou city council DDCVDD Littoral ALCTD	To be included into the ESMP of construction works and the environmental clauses
2.1.N.3.1; 2.2.N.5.1. ; 2.4.N.3.1. ; 2.15.N.2.1. Comply with the standards in force regarding noise production (rest hours)	Noise production level of equipment be in accordance with the standards	Number of complaints related to noise production noted and addressed	During the construction works at the base camp	The company's control office PO	Cotonou city council DDCVDD Littoral ALCTD	To be included into the ESMP of construction works and the environmental clauses

2.1.N.5.1., 2.2.N.2.1., 2.2.N.3.1., 2.2.N.4.1., 2.6.N.1.1., 2.13..N.3.3; 2.14.N.1.2; Water regularly the sites to reduce the emissions	The sites are regularly watered  Absence of cloud of dust during rush-hour traffic  Low dust deposition rate on nearby plants and vegetation	Number of complaints from residents and users of deviations noted and addressed	During the construction works	The company's control office	Cotonou city council DDCVDD Littoral ALCTD	To be included into the ESMP of construction works and the environmental clauses
2.1.N.5.2. ; 2.7.N.1.2. 2.13..N.1.3; 2.14..N.2.2 Ensure that the cars which are being used on the construction site are well maintained and serviced	Frequency of the maintenance	Measurement of gas emissions generated according to the standards	During construction works on the site and at the basic life	The company's control office	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into the ESMP of construction works and the environmental clauses
2.1.N.7.1. ; 2.2.N.8.1. Comply with the site building standards	The site building standards are respected	-Number of complaints noted and addressed -Number of injury	During the operating period of the site and the base camp	The company in charge of the works The company's control office	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into the ESMP of construction works and the environmental clauses
2.2.N.1.1., 2.2.N.10.4., Rehabilitate the sites that served as base camp at the end of the works	-The sites used as base camp are rehabilitated -Availability of the site for other uses	Absence of complaints	Just at the end of the operating periods of the base camp	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into the ESMP of construction works and the environmental clauses
2.2.P.1.1. Sensitize drivers to the respect of the highway code 2.10. N.5.4 Sensitize these cars drivers to good driving practices	Number of sensitizations made  Sensitization gatherings attendance list	Number of accidents noted	During the whole period of the materials transportation	PO The company in charge of the works The contracting company of the materials The company's Control Office	Cotonou city council DDCVDD Littoral ALCTD PO	2 000 000
2.2.P.3.1. Sensitize people to the risks of access to the base camp	Number of sensitizations made	-Number of injury -Number of offenders noted	During the operating period of the base camp	PO Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Already included
2.2.N.6.2. 2.1.N.2.2. To sensitize the employees to be on good neighborly relations with the local residents and respect the	Number and frequency of sensitizations made	-Number of complaints noted and addressed -Number of sensitizations	During the construction works and those of the base camp	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	2 000 000

habits and customs						
2.2.N.7.1. ; 2.3.N.5.1. ; 2.4.N.4.2. ; 2.11.N.2.1; 2.11.N.3.1. ; Respect contractual deadlines	Contractual deadlines are respected	Numbers of complaints noted and addressed	During the period stated by in the conditions of the contract	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included in the conditions of the contract
2.2.N.8.2. ; 2.4.N.8.1. Regulate traffic at intersection points of the base camp with public roads, crossroads and roundabouts	Presence of road signs for intersection works Presence of Traffic Control Officers	Number of accident noted Traffic holdup noted	During the works	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into the ESMP of construction works
2.2.N.8.3. Limit vehicles speed to 30 km/h on the construction site 2.10.	Presence of 30Km/ h speed limit signs	Number of accidents noted	During the works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into the ESMP of construction works
2.2.N.10.2. Provide sealed drums for the storage of oils and construction waste easily assimilated by SDW	Availability of sealed drums for the storage of oils and construction waste easily assimilated by SDW Waste removal contracts	Waste storage complying with the standards	During the operating period of the base camp	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into PGES- construction and the social and environmental clauses
2.2.N.11.1. Take care of the emergent product equipment's of the infirmary.	The infirmary has first aid products		During the operating period of the base camp and the sites	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into the environmental and social clauses
2.2.N.11.2. Sign a contract for biomedical waste removal with a competent healthcare center	Existence of the contract for biomedical waste removal Frequency of the removals	Biomedical waste removal should comply with the standards	During the operating period of the base camp and the sites	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included into PGES construction works and the social and environmental clauses
2.3. N.1.1. ; 2.3.N.2.1. ; 2.3.N.5.4. ; 2.3.N.6.1. ; 2.4.N.5.1. ; 2.5.N.1.3. ; Apply the measures stated in the PAR	The measures stated in the PAR are applied	Number of complaints noted and addressed	Before the works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Confer PAR
2.3.P.1.1. Sensitize the residents to what is a stake in the project	Number of sensitization sessions of the residents	Number of complaints	Before the start of the works	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Already included
2.3.P.3.1. 2.8.P.1.1. Sensitize residents to the efficient waste management	Local residents are sensitized to the effective management of waste	Number of waste removal contracts in the basin	Before and after the works	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Already included

2.3.P.3.2. Place a garbage bin at the pool	A garbage bin is placed at the outlet	Salubrity state of the sites	During the works	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	500 000
2.3.P.3.3. Apply the regulations in force on waste management	Waste collection rate as approved by competent structures	Salubrity of the sites	During the construction and the operation	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Confer Cotonou city council
2.3.P.3.4. Set up a committee to keep watch on the salubrity of the district and the developed basin	Existence of the citizen watch committee in every district	Salubrity state of the sites	From the beginning of the works	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	200 000
2.3.N.4.1.. Sensitize users of social and community infrastructures to the risks of accident during works	Numbers of sensitization made	Number of accident case noted	From the preparation phase to the end of the works	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Already included
2.3.P.4.1 ; 2.4.P.1.1 Plan a rubble dump site 2.11.N.3.2 Avoid "careless" deposits of rubble	Existence of rubble dump site	Number of sites available	Before demolition and implementation	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included in the conditions of the contract
2.3.N.5.1. Ensure temporary safe footbridges are built and respect contractual deadlines	Existence of temporary footbridge	Level of satisfaction of residents Number of accidents	During the whole period of the construction works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included in the conditions of the contract
2.3.N.5.3. ; 2.15.N.3.1. ; 2.15.N.4.1 Ensure that the roads are paved all the way up to the residents (side by side ) including the access ramps to homes	The paving of the roads all the up to the residents (side by side) is ensured	Satisfaction level of the residents	During the whole period of the construction works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	Already included
2.3.N.5.5. Plan secure parking areas for vehicles that cannot have access to their garage	Plan secured parking areas for vehicles that cannot have access to their garage Number of parking available	Number of parking areas Number of residents' complaints noted Number of thefts noted	During the whole period of the construction works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included in the conditions of the contract

4..N.3.3. Avoid working at night (start working at 7am and stop at 6 pm)	Provide specifications in employment contracts and the PGES construction works	Number of complaints noted and addressed, from residents and workers	During the whole period of the works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included in the conditions of the contract
2.4..N.3.4. Use less noisy machines	The technical specifications of the machines are specified in the conditions of the contracts	Number of complaints from residents noted and addressed	During the whole period of the works	PO MdC The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD Forestry Inspection Littoral	To be included in the conditions of the contract.
2.14.N.4.1. Sensitize the population to the nuisance made by the work (IRA, Conjunctivitis, Etc.)	The populations are sensitized to the nuisances made by the works (IRA, conjunctivitis, etc.)	Number of complaints Number of sensitizations	During the construction works of the base camp	PO The company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PO	To be included in the conditions of the contract.
2.4.N.6.1., 2.14.P.1.1. ; 2.17.P.1.1 Reforest the mains roads and the developed sites	The developed main roads are reforested	Number of trees planted and maintained	Just at the end of the works	PO Recruited company	Cotonou city council DDCVDD Littoral ALCTD Inspection forestière Littoral	8280000 at the rate of 10350 ml for a space of 25 m between 2 plants at the cost of CFA 20 000 per plant (purchase of plant, staking, drilling, planting and protection with a cage)
2.7.N.1.4. Set up wooded spaces in public places (schools, healthcare center, college, etc.) to capture greenhouse gases	Number of wooded areas	Reforested area Greenhouse gas rate captured	At the end of the works	Service provider PO	Cotonou city council DDCVDD Littoral	1 ha of useful plants, i.e. 100 plants with a spacing of 10 m at CFA 200000, upkeep cost included, and the maintenance expenses of the main roads (see below).
2.4.N.6.2. Maintain trees until optimal growth (over 5 years)	Existence of a tree upkeep contract until optimal growth Relining rate of planted trees	Number of surviving trees Surviving Upkeep contracts	From the end of the work until the end of the operation (at least two years)	PO Recruited company	Cotonou city council DDCVDD Littoral ALCTD Forestry Inspection Littoral	15 000 000 at the rate of 3 000 000 per year over 5 years.
2.4.N.7.1. Avoid work during the nesting of the species present	Number of disturbed bird nests	During the cleaning work	PO Recruited company	Cotonou city council DDCVDD Littoral ALCTD Inspection forestière Littoral	To be included in the environmental and social clauses	
2.4.N.7.2. Develop measures for the recovery of bird habitats 2.10.N.2.2 Elaborate an ornithological study for the protection of avian fauna	An ornithological study is elaborated	Number of birds protected	Before the works at the outlet	PO The company in charge of the works	ABE, Cotonou City council DDCVDD Littoral ALCTD	1 000 000 for each basin whose outlet is on Nokoué Lake and swamp
2.5.N.1.1. ; 2.5.N.2.1 Inform people of the different network	Number of radio broadcast	Number of complaints Duration of	While moving networks	Concessionaires of the various	Cotonou City council DDCVDD Littoral	To be included in the conditions of contract, the environmental and

movements needed for the works and warn them before any power cuts		disturbances		networks	ALCTD	social clauses
2.5.N.2.1. Minimize the time spent to move the concerned networks	Duration of disturbances	Number of complaints	During the relocation of the works	Dealers of various networks	Cotonou City council DDCVDD Littoral ALCTD	To be included in the conditions of contract, the environmental and social clauses
2.5.N.1.2. From the beginning of the project Implicate dealers to facilitate the relocation of the networks	Service provision contracts with the concessionaires	Level of disturbance of subscribers	before the relocation of the networks	dealers of the different networks PO	Cotonou City council DDCVDD Littoral ALCTD	To be included in the conditions of contract
2.6. Plan for road signs to guide road users	Existence of directional signs	Number of accident cases noted Absence of complaints	Before the start of the construction works	PO Company in charge of the works	Cotonou City council DDCVDD Littoral ALCTD	To be included in the conditions of contract and the PGES construction works
2.7. Put a canvass sheet over trucks which transport material from the collection site to the construction site	Trucks transporting materials are covered Absence of material spills on the transport route Compliance with traffic and loading standards.	Number of covered trucks Number of complaints from road users	Throughout the duration of the transportation of materials	PO Company in charge of the works	Cotonou City council DDCVDD Littoral ALCTD	To be included in environmental and social clauses and PGES-construction works
2.7.N.3.1. Set up public parking for a safe parking of the resident's vehicles	Existence of a parking	Number of theft Number of complaints noted	Throughout the duration of the works	PO MdC Company in charge of the works	Cotonou City council DDCVDD Littoral ALCTD	To be included in the costs of the works and PGES construction works
2.7.N.3.2. Secure the residents' vehicles parking	The resident's vehicle parking is secured	Number of parking set up Number of theft cases Number of complaints noted	Throughout the duration of the works	PO MdC Company in charge of the works	Cotonou City council DDCVDD Littoral ALCTD	To be included in the costs of the works
2.8.N.2.1. ; 2. 15. N.4.1. 2.15. P.1.1.2.15.N.1.2. ; 2.15.P.3.1, 2.15. N.4.1. Sensitize workers to the hygiene and good practices	Number of sensitization made	Number of conflict noted	During the construction works of the base camp	The company's control office	Cotonou City council Environmental Police Of the littoral department	To be included in PGES construction works
2.11.P.1.1. Give instructions to ensure the salubrity of the basin	Existence of instructions on the site Number of installed signs post (prohibition sign post )	Number of offenders penalized The basin salubrity state	During construction work	PO MdC Company in charge of the works	Cotonou City council DDCVDD Littoral ALCTD	To be included in PGES construction works
2.11.N.2.1. Comply with the basin development standards	The basin development standards are respected	Quality of the work	During the construction period	PO MdC Company in charge	Cotonou City council DDCVDD Littoral ALCTD	To be included in the environmental and social clauses and the conditions of contract

				of the works		
2.12.N.1.1. Cover trucks during the transport of garbage and cleaning products	Number of covered trucks	Number of complaints	During the transport	PO MdC Company in charge of the works	Cotonou City council DDCVDD Littoral	2 500 000
2.10.P.2.1.; 2.10.N.4.1. ; 2.10.N.6.2 Send mud obtained from cleaning services to the LES	Mud removal contract for trucks	Zero complaint noted during the works Absence of ground spills of mud	During the transport	PO MdC Company in charge of the works	Cotonou City council DDCVDD Littoral ALCTD PMU	To be included in the costs of the works
2.10.N.6.3. Comply with waste storage standards at the LES of Ouèssè	Zero landfill infiltration of cleaning products	Quality of the layer	During the operation of the LESS	PO MdC Company in charge of the works	ABE Cotonou and Ouidah town council DDCVDD Littoral ALCTD	2,966,690,000 At a rate of FCFA 10,000 per m <sup>3</sup>  83,500,000 At the rate of 3,000,000,000 shared by 36 basins for two landfill buriers and for all basins
2.10.N.3.1. Supply the outlet with useful plant seeds such as Typha sp, Thalia wellichii, Cyperus sp, etc. to compensate for the vegetation losses	The outlet is supplied with useful plants	Reforestation campaign of useful plants	At the end of the works and start of operation	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	3 000 000
2.10.P.2.7. ; 2.16.N.1.1. Plan for public rest rooms and urinals around the basin	Existence of public restrooms at the outlet	Number of restrooms built	During the works and at the end of the works	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	2 500 000
2.10.N.5.1. In case of unexpected spill, deploy the spill containment devices, recover them and manage them.	Existence of containment devices for spilled material	No spills in the water	During the works	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	To be included into the ESMP of construction works and the environmental clauses
2.15.N.5.1. Strictly Prohibit the relocation of AGR incompatible with the durability of the structure	Absence of AGR incompatibles with the developed roads	Strict Prohibition of relocation	At the end of the works	Service Providers PO Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	Confer the City Council
2.12.P.1.1. Sensitize the neighboring residents of the basin	Frequency of sensitization, fine, and sensitization reports	Salubrity state around the basin Number of sensitization made	During the development of the basin	Service Providers PO Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	Already included

2.16.N.1.2. Place garbage cans along public bench site	Existence garbage cans Number of garbage cans placed	Salubrity State of the site	During the implementation of of public benches	Cotonou city council	PO MdC DDCVDD Littoral PMU	100,000 to 25,000 per bin
2.16.N.1.3. Ensure periodic cleaning of the premises	Existence of periodic cleaning contracts of the works	Frequencies of maintenance services Operating efficiency of the works	During the development period of the basin	Service provider PO Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	To be included in the conditions of contract
2.17.N.1.1. Set up committee for the security of basin	Existence of a resident committee for the safety of the collectors	Salubrity state along the collectors	During the development works of the basin	PO MdC Company in charge of the works	Cotonou city council DDCVDD Littoral ALCTD PMU	200000
2.18.N.1.3. Create a framework for meeting between the different project players to exchange documents and information	Existence of a meeting framework for the implementation of all projects		Before and during works construction and the development of the basin	PO ALCTD	Cotonou city council DDCVDD Littoral PMU	Confer PO
2.18.N.2.1 Implement the collectors and the basins of PAPVIC before the development of the concerned streets to avoid their degradation	Works Implementation plans of the different projects	Absence of degradation / work on newly developed streets	Before and during works construction and the development of the basin	PO Company in charge of the works	Cotonou city council DDCVDD Littoral PMU ALCTD	Confer agency of the living environment ALCTD

2.18.N.3.1 ; 2.18.N.4.1 Implement environmental and social requirements and meet deadlines	Absence of complaints	Reduction of nuisances made by the works	Before and during works construction and the development of the basin	PO	Cotonou city council DDCVDD Littoral PMU ALCTD	Confer ALCTD
2.18.N.3.2 Provide specific clauses for the construction companies regarding good practices (no spills in the water, no solid waste discharge, no release of hazardous materials.	Existence of clauses specific to these activities in the tender	Compliance with environmental and social requirements during the works	During the development works of the basin	Companies in charge of the cleaning PO	Cotonou city council DDCVDD Littoral PMU ALCTD	To be included in the environmental and social clauses of each project
2.18.N.5. 2. Plan for ducts or reservoir on the streets in conjunction with the concessionaires of the different networks	Availability of ducts and reservoirs on developed streets	Absence of degradation / work on newly developed streets	During the development works of the basin	Companies in charge of the cleaning PO	Cotonou city council DDCVDD Littoral PMU ALCTD	To be included in the conditions of contract

## **Complaint management mechanisms**

The following mechanisms are proposed to resolve conflicts that may arise from the implementation of the Cotonou Stormwater Management and Urban Resilience project (CSMURP). The process consists of two (02) phases: the amicable settlement phase and the judiciary phase.

The out-of-court settlement phase consists of four (04) levels:

- **1st level**

Any person who feels aggrieved by the implementation of the project or who has grievances against the company responsible for carrying out the works must file a request with the Local Resettlement Committee (LRC), which sits at the Borough level, for the settlement of the dispute.

- **2nd level**

If the dispute is not settled, the applicant or complainant appeals to the Technical Resettlement Committee (TRC), which meets at the Town Hall.

- **3rd level**

If the dispute is not settled, the applicant or complainant shall have recourse to the Prefect.

- **4th level**

If the dispute is not settled, the applicant or the complainant refers the matter to the Minister of the Living Environment and Sustainable Development through the Agency for living Conditions and territories developments. In the event of dissatisfaction at these four levels, the applicant may bring an action before the court.

The time limits for processing complaints at these different levels must not exceed fifteen (15) days from the date of receipt of the complaint.

Specifically, the Technical Committee for Resettlement set up at the Cotonou City Hall will provide the affected persons with the telephone numbers of its Administrative Secretary or Rapporteur.

A log will be opened for this purpose to receive complaints that will be processed. Complaints and grievances will be reviewed in session by the TRC. Proposals for responses will be received by complainants through representatives of affected persons who are members of the TRC or the Neighborhood Chief. Complainants may meet with the TRC at periodic meetings to present their concerns orally.

Affected persons will be informed of the existence of all these provisions.

In addition, a similar system is installed at the Local Resettlement Committee, which sits at the Borough level. Legal action is possible if the amicable settlement fails. It begins with a complaint filed either at the level of the Borough Police Office or directly at the level of the Public Prosecutor at the Cotonou Court of First Instance.

The estimate costs of the ESMPs is thirty-four billion one hundred and fifteen million six hundred and nine thousand four hundred and sixteen (34 115 609 416) CFA francs, or fifty-eight million eight hundred and twenty-three two hundred and sixty-one, point one (58 823 261.1 US dollars).

**Table 1: Approximate Costs of Implementing ESMPs**

TFP	Basins	Costs in FCFA	Costs in US dollars
WADB	WW1	275 904 334	478 105,00
	WW2	276 816 014	179 684,00
	WW3	275 700 174	477 751,00
	WW4	275 813 114	477 947,00
	Zb1	158 796 794	275 173,00
	Zb2	159 034 394	275 585,00
	Zb3	159 183 994	275 844,00
	Zb4	159 224 474	275 915,00
	Pb	360 864 264	625 338,00
	Aba	268 233 264	464 812,00
	Pc	300 298 264	519 849,00
	AAss	5 010 729 264	8 682 903,00
	Abb/Abc	927 034 264	1 606 423,00
	<b>SUBTOTAL</b>	<b>8 607 632 612</b>	<b>14 615 329,00</b>
EIB	S	62 045 882	107 531,90
	Sbis	62 165 882	107 739,80
	Rabis	51 825 882	89 819,60
	Qb	67 105 882	116 301,40
	Ra	51 825 882	89 819,60
	<b>SUBTOTAL</b>	<b>294 969 410</b>	<b>511 212,10</b>
FDA	Wa	416 700 264	722 085,00
	XX	1 359 789 314	2 677 095,00
	X1	234 600 112	420 097,00
	X2	218 066 512	389 718,00
	X3	234 600 112	420 097,00
	X11	218 066 512	389 718,00
	Wab	345 574 264	598 833,00
	Subtotal	<b>3 027 397 090</b>	<b>5 246 788,70</b>
IDB	Rb-Rd	221 890 264	384 505,00
	Rc	365 759 264	633 810,00
	D	2 730 033 264	4 730 771,00
	LB-LS	497 279 664	861 717,00
	M	424 202 264	735 084,00
	AAn	2 799 322 264	4 850 840,00
	Subtotal	<b>7 038 486 984</b>	<b>12 198 417,60</b>
ADB	Qc	1 439 810 264	2 494 992,00
	Pa2	4 629 854 264	8 022 872,00
	Subtotal	<b>6 069 664 528</b>	<b>10 519 349,30</b>
WB	Aac	5 054 524 264	8 748 333,00

	Pa3	<b>3 478 496 264</b>	6 020 555,35
	Y	558 238 264	966 022,00
	Subtotal	<b>9 091 258 792</b>	<b>15 734 910,35</b>
<b>Total Amount</b>		<b>34 129 409 416</b>	<b>58 826 007,05</b>