Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Dakar, Senegal

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Abbreviations	Meanings
AAAS	Sanitation Emptiers Association in Senegal
ADB	African Development Bank
AFD	French Development Agency
ANSD	Agency of Statistic and Demography of Senegal
BADEA	Arab Bank for Economic Development in Africa
BOAD	West African Development Bank
BMGF	Bill and Melinda Gates Foundation
CAPEX	Capital Expenditure
DA	Direction of Sanitation
DGPRE	Direction of Water Resources Management and Planning
EIB	European Investment Bank
EU	European Union
F.CFA	Currency for Senegal and others French speaking countries in West Africa (500 F.CFA= 1 USD approx.)
FS	Faecal Sludge
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
IDA	International Development Association
IDB	Islamic Development Bank
IPA	Innovations for Poverty Action
LDPS	Sectorial Development Policy Letter of Water and Sanitation
MDG	Millennium Development Goals
MHA	Ministry of Hydraulic and Sanitation
MWh	Megawatt per hour
NBED	National Bank of Economical Development
NGO	Non-governmental organization
OFOR	Office of rural wells or boreholes
OLAC	Office of Lakes and Rivers in Senegal
ONAS	National Office for Sanitation in Senegal
OP	Omni-Processor
OPEX	Operational Expenditure
O&M	Operation and Maintenance
OXFAM	Oxford Committee for Famine Relief
PSFSM	Program for the Structuring of the Faecal Sludge Market
PEPAM	Water and Sanitation Program for the Millennium
PPP	Public-Private Partnership
SDE	Senegalese Water Company
SDG	Sustainable Development Goals
SONES	National water company of Senegal
(UN- Habitat)	United Nations Human Settlements Programmes
WB	World Bank
WSA	Water and Sanitation for Africa
WWTP	Wastewater Treatment Plant

PART A: SHORT BACKGROUND ON THE COUNTRY

A.1.: Social, political and economical data at the national level

A.1.1.: Social

According to the census implemented in 2013, by the Agency of Statistic and Demography (ANSD), the total population of Senegal was 13 508,715 inhabitants, with 6,102,800 (45.1 %) and 7,405,975 (54.9%) living respectively in urban and rural areas. The Table 1 shows the population and average annual growth rate from 1988 to 2013 based on the results of the census. At the country level, the annual growth ratio (2013) was 2.5% versus 3.5% for urban and 1.7% for rural. Although, the population in rural is higher than urban, the total increase in urban areas, between 2022 to 2013, was more than 50 %.

Table 1: Population and Growth Ratio of the Republic of Senegal from 1976 to 2013

Years	1976	1988	2022	2013
Periods	-	1976-1988	1988-2002	2002-2013
Urban Population	1,713,295	2,653,943	4,008,965	6,102,800
Growth Ratio (%/year)	-	3.7	3.0	3.5
Rural population	3,284,590	4,242,865	5 849,517	7,405,915
Growth Ratio (%/year)		2.2	2.3	1.7
Total population	4,997,885	6,896,808	9,858,482	13,508,715
Growth Ratio (%/year)	-	2.7	2.5	2.5

Source: ANSD, Census 2013.

The total area of the country is 196,712 Km^2. As for the density of the population, Senegal has a value of 65 inhabitants per Km^2. With a poverty index of 46.7 %, the country has more women (50.1 %) than men (49.9 %). The rate of general literacy and the gross schools enrolments rate, respectively account for 52.1 % and 52.9 % (ANSD, 2013).

A.1.2.: Politics

The Republic of Senegal is a country located in West Africa (14° Nord of the Equator and 14° west of the Prime Meridian), and bordered on the West by the Atlantic Ocean, on the Nord by Mauritania, on the East by the Mali, and on South by the two Guinea (Bissau and Conakry). It is one of the most stable countries in Africa. The country is divided into 14 Regions and covers an area of 196,712 Km^2. A semi-presidential democratic republic regime is applied, where the President of Senegal is the head of State, and the Prime Minister is the head of Government. They compose the executive power. In addition, the country has a legislative and judiciary powers, which respectively, introduce legislation or vote down legislation proposed by the Government, and over control the judiciary.

A.1.3.: Economy

Senegal aspires to become an emerging Country by 2035. To achieve this important target for the country, in 2014 the Government of Senegal adapted a new Plan Senegal Emergent (PSE) designed to help the country, to pull it out of the cycle of low growth and weak poverty reduction that had affected it after several decades. The Gross Domestic Product (GDP) is for the country expanded to 6.4 %. Supported by the sectors of Agriculture and Industry, the Economic growth of Senegal reached about 6.5 % in 2016 and 2017. Therefore, putting the country among the best economic performance in Sub-Saharan Africa. These interesting results were obtained because of a greater competiveness, punctual progress in structural reforms and a favourable external environment. More so, although it is projected an economic growth of 6.8 % (2017) to 6.9 % (2018), the PSE targeted a value of 8.3 % in 2018, to allow Senegal to become a middle incomes country.

A.2. Constitutional structure on setting policies, budget and implementation works

In the Senegalese water and sanitation sector, the National Government defines political orientations, implements strategies and mobilizes resources.
The Ministry of Hydraulics and Sanitation, the technical services (Direction of Hydraulic, Directorate of Water Resource Management and Planning – DGPRE), the administrations (OFOR, ONAS, OLAC) and the national companies (SONES) bounded to it, ensure the implementation of political orientations defined by the National Government. Based on this:

- The Direction of Hydraulics provides supervision and strategic planning of drinking water in rural areas in connection with the Office of Rural Wells (OFOR). OFOR is responsible for the implementation and renewal of hydraulic infrastructures, the management of assets and the water supply public services by means of delegation agreements to privates entities.
- The DGPRE is in charge of the knowledge, management and control of the resource in connection with the Office of Lakes and Rivers in Senegal (OLAC), which integrates the attributions previously devolved in this sense to the Office of Guiers Lakes and the Agency for the promotion of National Hydrographic Network.
- SONES makes the investments and manages the urban water assets in the dedicated areas of interventions. It has been supervising the private sector, the Senegalese Water Company (SDE) which is in charge of operating and maintaining the water supply distributions networks in Senegal under PPP for more than 20 years.
- The Direction of Sanitation provides supervision and strategic planning of sanitation in rural areas. More so, this direction ensures the management of sanitation services investment programmes for rural populations, as well as the technical supervision of ONAS, which is responsible for the management of wastewater and human excreta and storm water sanitation in urban areas.

A.3. Water and sanitation data at the national level

A.3.1: Water and sanitation in urban areas of Senegal

The global access to water supply in the urban areas of Senegal reached 98 % in 2015 (PEPAM, 2016), the reference target rate that was defined by the Millennium Development Goal (MDG, 2015). The access rate for the population to an improved sanitation system in this same urban areas, was estimated to 62.2 % in 2015, which was higher than the average rate obtained in the urban Sub-Saharan Africa (40 %) but lower than the average urban worldwide (82%). Concerning open defecation in urban areas, it was 4 % in 2015.

A.3.2: Water and Sanitation in rural areas of Senegal

In the rural areas of Senegal, the global water access covered 87.2 % of the population in 2015 (Pepam, 2016). As for the sanitation in rural areas, the access rate was counted for 36.7 % in 2015. Similarly, to the access of urban sanitation, the rural access rate for sanitation was higher than the average of rural Sub-Saharan Africa (23 %) but lower still lower than the average rural worldwide (51 %).
In total at the country level, the MDG was almost achieved for the water sector, but not for the sanitation. Conscious about this fact in sanitation, the Senegalese Government recognizes that lot of efforts still need to be done in this regard to fill this gap and meet the United Nation's Sustainable Development Goals (SDG) that is the target for over the next 15 years (by 2030).

A.4. Institutional responsibility for Sanitation at the national level

In Senegal, the key actors in the sanitation sub-sector are: 1) the Ministry of Hydraulics and Sanitation (MHA), 2) the Directorate of Sanitation (DA), 3) the National Office for Sanitation in Senegal (ONAS) and local communities.

A.4.1. Ministry of Hydraulics and Sanitation

According to the Decree No. 2014-877 of July 22, 2014 relating to the attributions of the Minister of Hydraulics and Sanitation, the Ministry of Hydraulics and Sanitation prepares and implements the policy defined by the head of the State in the fields of hydraulics and sanitation. In other words, in Senegal, the Government is represented in the water and sanitation sector by the Ministry of Hydraulics and Sanitation, which is the authority to set policies and approve all plans and projects. Thus, he is responsible for sanitation policy at the national level. Specifically, the Ministry of Hydraulics and Sanitation is responsible, among others of:

- ensuring the development, the monitoring and implementation of strategies, sectorial and tariff policies defined by the State in the field of sanitation in urban and rural areas;
- ensuring the realization and maintenance of infrastructures for the collection, treatment, and disposal of wastewater. Therefore, it oversees ONAS;
- following up with ONAS the planning, the executions of studies and the implementation of urban sanitation (liquid waste) programmes;
- monitoring the activities of companies and other autonomous administrations involved in the sanitation sector;
- following the files related to international organizations and falling within its field of competence.

By virtue of all these powers, the Ministry's mission is to promote, in a sustainable manner, universal access to appropriate sanitation systems.

A.4.2. Directorate of Sanitation

The Directorate of Sanitation directly bounded to the Ministry of Hydraulic and Sanitation assists the Ministry of Hydraulic and Sanitation in the implementation of policies in the water and sanitation sector. More specifically, the Directorate of Sanitation is in charge of:

- ensuring the development, the monitoring and implementation of strategies and sectorial and tariff policies defined by the State in the field of sanitation in urban and rural areas;
- overseeing ONAS through the MHA;
- ensuring the planning and programming of investments, the coordination and projects management, the design and control of studies and implementation works related to sanitation facilities in rural areas;
- promoting sustainable access to sanitation for households living in rural areas;
- ending open defecation in rural areas and promoting behaviour changes of rural population.

A.4.3. National Office for Sanitation in Senegal (ONAS)

ONAS, is a provider of sanitation services in urban and peri-urban areas. It was created in 1996 (Law No. 96-02 of 22 February 1996). It is a public company of industrial and commercial nature and is linked to the National Government by a performance contract, which specifies the reciprocal obligations of the two parties and the objectives to be reached in order to improve sanitation services of domestic and industrial wastewater (classic sewerage, simplified sewerage, onsite sanitation) and to ensure the financial balance of ONAS. More specifically, ONAS ensures:

- the planning and programming of investments, the coordination and projects management, the design and control of studies and implementation works related to sanitation facilities and wastewater works.
- the operation and maintenance of wastewater treatment facilities;
- the development and promotion of on-site sanitation systems,
- the valorisation of by-products generated from wastewater treatments plants.

A.4.4. Municipalities

With regard to municipalities, the sanitation code and the code of municipalities do not give any specific competence to them in the management of wastewater and human excreta. However, they have a general competence in the field of public health, of which sanitation is one component.

A.5. Financing mechanisms for water and sanitation at the national level

The mobilization of finance for the water and sanitation sector for the Republic of Senegal from 2005 to 2015 is shown in the Table 2. For duration of 10 years, a total amount of 1,328.053 billion of F.CFA was mobilized for the water (64.1 %) and sanitation (35.9 %) sector at the country level. As for the financing source of this total amount dedicated to the sector of water and sanitation (Figure 1), 74 % was borrowed from donors, 15 % derived from subsidies (grants), 10 % from State (Central Government) and 1 % from the contribution of municipalities (local Government). Except the case of rural water supply (16.7 billion F.CFA), municipalities do not contribute in general to the sector of water and sanitation financing mechanism.

Table 2: Mobilization of finance for the water and sanitation sector in Senegal (2005-2015)

Sub-Sector	Financial Sources	Amount (Billion F.CFA)	Rate (%)
1. Water Supply			
1a. Urban Water Supply	Borrow	452.334	94.8
	Subsidies (grants)	12.194	2.6
	State	12.419	2.6
	Municipalities	0.000	0.0
	Sub-Total 1a.	476.946	100.0
1b. Rural Water Supply	Borrow	130.472	34.9
	Subsidies	122.317	32.7
	State	104.819	28.0
	Municipalities	16.700	4.5
	Sub-Total 1.b	374.308	100.0
	Total General (1)	851.255	64.1
2. Sanitation*			
2a. Urban Sanitation	Borrow	211.735	85.0
	Subsidies	34.874	14.0
	State	2.491	1.0
	Municipalities	0.000	0.0
	Sub-Total 2a	249.100	100.0
2b. Rural Sanitation	Borrow	185.809	81.6
	Subsidies	31.196	13.7
	State	10.693	4.7
	Municipalities	0.000	0.0
	Sub-Total 2b.	227.698	100.0
	Total General (2)	476.798	35.9
	Total Genera (1) + (2)	1,328.053	100.0

* Sanitation here does not include storm water or flood management

Source: PEPAM, 2016

From 2005 to 2015, 85 % of finance for urban sanitation in the country was borrowed in form of loans. And it is important to mention that the reimbursement of loans strongly depends on the set procedures from each donor. The following loans types was made by the Government and depending on the donors:

- Concessionary loans: Repayment period of 38-40 years, with a grace period of 10 years and an interest rate of 1%;
- Semi-concessionary loans: Repayment period of 20 years, with a grace period of 10 years and an interest rate of 2- 4 %;
- Commercial loans: Shorter repayment periods than those above and an interest rate of 6-7 %.

None of services providers (e.g. ONAS) includes the cost of repayment within its operating costs. Therefore they are not covered by tariffs. The repayment of loans is under the Government responsibility that are in charge of reimbursing them based on the agreements with donors.

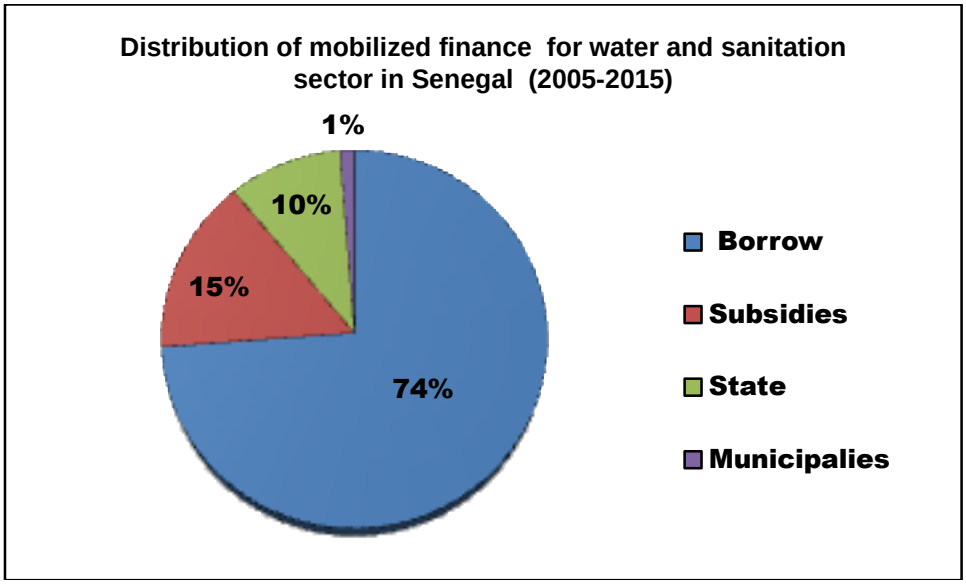


Figure 1: Repartition of mobilized finance for the water and sanitation sector in Senegal (2005-2015)

From 2015 to 2015, several donors contributed to the mobilization of funds for financing water and sanitation in Senegal and among them: West African Development Bank (BOAD), International Development Association (IDA), European Union (EU), French Development Agency (AFD), Islamic Devolvement Bank (IDB), African Development Bank (ADB), European Investment Bank (EIB), World Bank (WB), Arab Bank for Economic Development in Africa (BADEA) United Nations Human Settlements Programmes (UN- Habitat), etc.

Remarks:

Based on the latest information collected in the water and sanitation sector (Sectorial Development Policy Letter, 2015-2025, "LDPS 2016"), from 2005 to 2015, the sector had mobilized an amount of 998 billion F.CFA all financial sources excluding trans borders cooperation's. About 16 % of this global amount was covered by the Central Government. The portion of sanitation was estimated about 147 billion (60.47 billion for rural and 86.4 billion urban), which represents 14.7 % of total mobilized amount from 2005-2015. Considering the portion of water in this same period, it was accounted for 851 billion (374 billion for rural and 477 billion for urban), which constitutes 85.3 % of global mobilized amount. Focusing still on the water part, it is reported that the mobilized financial resources was deriving essentially from loans (34.9 % for rural and 94.8% for urban) and subsidies (32.7% for rural and 2.6 % for Urban) and the contributions from Government through the consolidated budget for investment (26.0 % for rural and 1.7 % for urban). Comparing these above information (LDPS, 2016) with those analysed in the Table 2 and Figure 1 (PEPAM, 2016), a bit of contrast occurred in the total mobilized amount between 2005-2015 in the water and sanitation sector in Senegal (about 998 billion versus 1,328 billion). These contrasts of data attest the reliability or accuracy of these financial data. However, this financial information provides an indication on how the water and sanitation sector in Senegal is being financed at the national level.

The policy preference of the Senegalese Government is to install waterborne sewerage in all urban areas in Senegal in the future. However, since sewerage systems are excessively costly and there is currently an urgent need of sanitary facilities in the urban areas, the Government is accompanying the population with On-site sanitation as alternative option because of its cheapness (low cost sanitation facilities).

A.7. Concept of circular economy views at the country level.

The concept of circular economy is understood and accepted in Senegal. A couple of references corroborated this statement. The decree n° 96-662 of August 7, 1996, which fixes the organization and functioning rule of ONAS, discusses (in its Article 15) the different sources of financial resources of the Institution and among which the by-products are generated from the operations of sanitary facilities (water, electricity, fertilizer etc.). As an illustration, among these financial sources of ONAS, only the sanitation tax (which derived from the sale of water supply), and the by-products obtained from the operation of the treatment plants and the subsidies are currently mobilized. In 2015, the

total revenues amount collected from the sale of by-products was estimated up to 22 million F.CFA (3 % from the sale of treated water, 1.5 % from the sale of treated faecal sludge and 97.5 % from faecal sludge treatment plants (FSTP) activities – FSTP's emptying taxes from trucks) and represented 0.1 % of the total revenues of ONAS, which is not significant. However, even this rate is still low, the water and sanitation authorities recognized that the generated by-products from sanitary facilities should be valued in a sustainable way. For this reason, it is recently plans in the new Sectorial Development Policy Letter for 2025 (LDPS, December, 2016) to reinforce the capacity of the wastewater and faecal sludge treatment plants and subsequently valorised the generated sanitation by- products.

PART B: SHORT BACKGROUND ON THE STUDY CITY

B.1. Social, political and economical data at the city level

B.1.1: Social

The Dakar Region, which is the capital of the Republic of Senegal, is the most populated urban area in the country. Based on the last census (ANSD, 2013), its total population was 3,137,196 inhabitants with an annual growth rate of 3.4 %. The Table 3 represents the population and the growth rate of the Dakar Region from 1976 to 2013.The total increase of the population between 2002 and 2013 is about 50%.

Table 3: Population and Growth Ratio of Dakar Region from 1976 to 2013

Years	1976	1988	2002	2013
Periods	-	1976-1988	1988-2002	2002-2013
Dakar population	892,127	1,488,941	2,168,314	3,137,196
Growth Ratio (%/year)	-	4.4	2.72	3.4

Source: ANSD, Census 2013.

The density of the population in this Region is 5,735 inhabitants per Km^2 and is considerably far demarcated from the values obtained in the other Regions of Senegal. At the country level the total population is 13,508,715 in 2013 and the Dakar Region constitutes nearly a quarter (23.2 %) over an area of only 0.3 % of the Country. Dakar Region has a number of four (04) departments namely the department of Dakar, Pikine, Guediawaye, and Rufisque, and the population in these departments represents respectively 36.5 %, 37.4 %, 10.5 % and 15.6 % of the Regional population. With a poverty index of 26.1 %, the Region of Dakar has nearly the same ratio of men (50.3 %) and women (49.7 %). The rate of general literacy and the gross school's enrolments rate, respectively account for 68,6 % and 64.3 % (ANSD, 2013).

B.1.2: Politics

The Region of Dakar, one of the fourteen (14) Regions of Senegal is located in Cap Vert Peninsula and covers a total area of 550 Km^2. Geographically located between 17° 10 and 17° 32 longitude West and 14° 53 and 14° 35 latitude Nord, the Dakar Region is bounded on the East by the Region of Thies and by Atlantic Ocean in all other sides (Nord, West and South). It is composed by four (04) departments: 1) the department of Dakar (with an area of 79 Km^2), 2) Pikine (87 Km^2), 3) Guediawaye (13 Km^2) and the department of Rufisque (372 Km^2).
It hosts the headquarters of the Government, the National parliament, the Constitutional Council, the Supreme Court, all National Directorates, as well as almost all headquarters of national and private companies, and all national and international organizations settled in Senegal. Thus, the Senegalese capital is a decision-making centre at public and private, national, regional and international levels.

B.1.3: Economy

Similarly, to the social, administrative and political activities of the Country, Dakar the capital city, accounts for the large part of the economy (80 % of the domestic economic outputs). Thus the Region concentrates the vast majority of industries, business, and finances.

B.2.: General Water and Sanitation data for Dakar

In Dakar Region the household water connections was rated to 96.2 % compared to others urban centers of the country (Pepam, 2016). And even within the Dakar Region, several disparities were found with a connection rate of 100 % for Dakar I (Dakar department), 97 % for Dakar II (including Pikine and Guediawaye departments) and 90 % for the department of Rufisque. As for the public facets the access rate for Dakar was 4 %, 10 % for Rufisque and 13 % for the other urban centers in Senegal.
Considering sanitation coverage for the Dakar Region, it was estimated to more than 78 % in 2015. Onsite sanitation system is the most predominant sanitation systems in Dakar Region (over 75 %, Dakar Master Plan 2013). Focussing on the department of Pikine and Guediawaye the biggest peri-urban areas in Dakar, and Senegal, the population is estimated at about 1,500,000 people and more than 80 % are connected to on-site sanitation systems.

PART C: DETAILED INFORMATION ABOUT THE SANITATION OF DAKAR

The total population in Dakar Region was estimated at about 3,137,196 inhabitants with an annual average of Growth of 3.4 % (ANSD, 2015). In the city, it exists three (03) different types of sanitation systems: 1) classical centralized sewerage system (27.4 % of the population is connected), 2) simplified sewerage systems (2.0 % is connected) and 3) on-site sanitation systems (70.6 % of the population is deserved).

C.1. Sanitation infrastructures at the city level

C.1.1. Classic sewerage system

In Dakar, the assets of ONAS in terms of classical sewerage systems (Table 4) are composed of as follows:

- 04 wastewater treatment plants (33 % of the total number of WWTPs in the country);
- 1,326 Km of network lengths (78 % of the total national level network length);
- 55 pumping stations (62.5 % of the total number of pumping station in Senegal);
- 107 467 household connections to sewer lines (83.5 % of the total household connections to sewer at the national level).

Table 4: Assets of ONAS infrastructures in Dakar

Existing types of sanitation systems	Dakar Region
1. Centralized Sewerage Systems	
Network Length (Km)	1,326
Household connections to sewer	107,467
Pumping stations	55
Wastewater Treatment Plants (WWTP)	04
2. Simplified Sewerage Systems	
Network Length (Km)	212
Household connections to sewer	11,477
3. On-site sanitation	
On-site toilets	66,000 >
Faecal Sludge Treatment Plant (FSTP)	04

Source: Financial statement of ONAS, 2015

The total capacity of the wastewater treatments plants in Dakar is estimated at about 27,906 m^3/day (Table 5), while 23,586 m^3/day is currently under operation (2 WWTPs are under commissioning). The total effective existing capacity of the WWTPs in Dakar (23,586 m^3/day) represents more than 70 % of the all country.

Table 5: Features of the mains treatments plants facilities in Dakar

Treatment facilities	Year of Construction	Capacity (m^3/day)	Type of facilities	Current State
1. WWTPs				
1.a. Camberene	1989 & Expansion 2008	19,200	Activated Sludge	Under operation
1.b. SHS	2007	595	Activated Sludge	Under operation
1.c. Niayes	2008	935	Activated Sludge	Under operation
1.d. Rufisque	2004	2,856	Lagoon basins	Under operation
1.e. Tivaouane Peulh	2015	2,520	Activated Sludge	Commissioning
1.f. Diamniadio	2015	1,800	Activated Sludge	Commissioning
Total (1)	-	27,906	-	-
2. FSTPs				
2.a. Camberene	2008	120	Double corridor	Under operation
2.b. Niayes	2009	60	Double corridor	Under operation
2.c. Rufisque	2007	60	Double corridor	Under operation
2.d. Tivaouane Peulh*	2015	400	Double corridor	Under operation
Total (2)	-	640	-	-

* Tivaoune Peulh FSTP has started operating recently (October, 2017), while from 2015-2016, it was under commission's phase. In other terms before 2016, the total capacity of the FSTPs in Dakar was 240 m3/day.
Source: Treatments facilities assets of ONAS in Dakar, 2017

C.2.2. Simplified sewerage system

The specificity of simplified sewerage system is to allow the reduction of the diameters of pipes and the implementation slopes in comparison with the classic sewerage systems. The simplified sewerage system is used in Dakar, with a total length of 212 km for a number of 11 477 household connections (Table 4). Except for the Dakar Region, this type of sanitation system is not yet installed in other cities of Senegal.

C.2.3. On-site sanitation system

On-site sanitation system is the most predominant sanitation system in Dakar (more than 70 %) as well as for the national level. In the peri-urban areas of Dakar (Pikine and Guediawaye), the vast majority of the population (more than 80 %) relies on such kind of systems, and an amount of more than 1,500 m^3 of sludge is produced in a day. Therefore, to contribute to the management of this produced sludge, ONAS has built four (04) faecal sludge treatments plans in Dakar with a total capacity of 640 m^3/day (Table 5). The Dakar faecal treatments plants represent 40 % of the total existing FSTPs in the whole Senegal. As for capacity of the FSTPs in Dakar (640 m^3/day) represents 52 % of total capacity at the national scale (1230 m^3/day).

C.2. Historical trends in Sanitation

C.2.1: Trend of access to sanitation in Dakar (2004-2015)

The trends of access to sanitation in Dakar and all urban areas in Senegal as well as the target objective for urban sanitation at the national level from 2004 to 2015 are presented in the Figure 2. The access trend rate for sanitation in Dakar was constantly higher than both set target and obtained results for the urban at the National level from 2004 to 2015. From 2011 to 2015 a decrease in access rate for Dakar (80.93 % to 78.17 %, respectively) was observed and might be caused by the increase in population in the Capital City due to rural exodus. Similar tendency of decrease was found (63.2 % to 60.2%) in the global urban sanitation access trend results at the national level from this same period (2011 to 2015), perhaps pulled down by the Dakar's results decrease. The access rate gap between the national target and national obtained results related to urban sanitation was (- 0.7) point in 2008 and reached a high value of (– 17.18) points in 2015. These latest results could be explained by the increase of the population in the urban areas

combined with the reduction in funding availability. Because in 2005, the PEPAM was created, and funds available, and several investments were done in the sector of water and sanitation in Senegal including in urban areas.

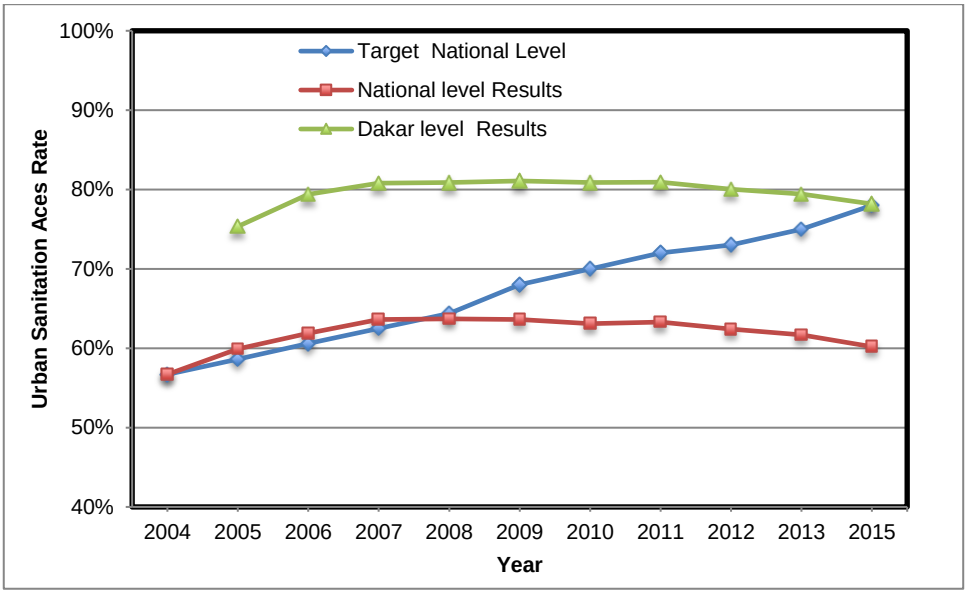
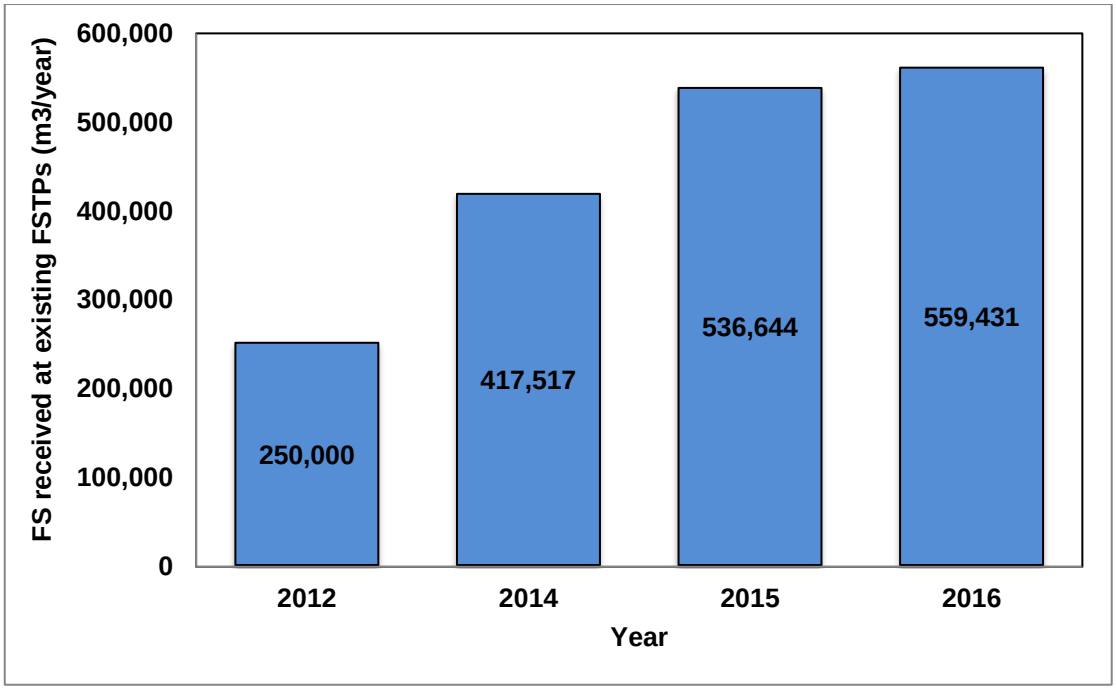


Figure 2: Trend of Urban Sanitation access in Dakar and Senegal from 2004 to 2015

C.2.2: Trend of FS volume received in the FSTPs in Dakar (2012-2016)

From 2008 to 2016, ONAS has built a number of three (03) different faecal sludge treatment plants in the Dakar Region: 1) the FSTP of Camberene, 2) the FSTP of Niayes and 3) the Rufisque's FSTP. These three (03) FSTPs have a total annual capacity of 87, 600 m^3, which is equivalent to 240 m^3/day. The Figure 3 shows the annual total FS volume received in these faecal sludge facilities from 2012 to 2016. The received annually volumes of FS in the FSTPs increase significantly by almost 50 % from 2012 to 2016.

Comparing the total annual designed capacity of these plants (87, 600 m^3/year) with the results obtained in the Figure 2, it is clear that, these facilities are overloaded and sufficient investment in FS infrastructures is necessary for Dakar. That is why a new FSTP called Tivaouane Peulh's FSTP which was built in 2015 and under commissioning with a capacity of 400 m^3/day has been put recently in operation (October, 2017) by ONAS. Subsequently that brings the total capacity of the FSTPs in Dakar to 640 m^3/day (233,600 m^3/year), which is still not even enough to cover the needs in FSTPs infrastructures. Furthermore, the annual FS volumes received in the FSTPs from 2014 to 2016 (more than 400,000 m3/year) were significantly higher than the result of 2012 (250,000 m^3/year). One reason might be the better management of FSTPs by the private sector compared to the public management. Because, in 2012 ONAS was operating these FSTPs; and in 2014, ONAS has delegated their management to the private sector in concession contract based (PPP model). And the private sector records better than ONAS, simply because truck emptying activity to the FSTPs is one of their main sources of revenues (See Section D.2.2.2).



Source: ONAS, Compiled by SenEngineering International S.A.

Figure 3: Trend of the annual FS volume received at the 03 existing FSTPs in Dakar (2012-2016)

C.3. Projected plans on sanitation coverage by 2025 for Dakar

The projected investment program of ONAS for Dakar (Dakar + Rufisque) in 2025 is shown in the Table 6. From 2018 to 2019, the essential portion (87 %) of the plan of WWTPs construction will be completed in Dakar. While from 2018 to 2025 a number of 100,000 household connections to sewer line combined with an extension of network of 1,158 Km will be implemented.

Table 6: Investment plan for Sanitation of wastewater and human excreta for Dakar (2015-2025)

Projected facilities	Years											Total
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Capacity of WWTPs (m3/day)	0	0	0	4,109	157,800	0	0	0	0	0	25,000	186,909
Capacity of FSTPs (m3/day)	0	400	0	80	0	0	0	0	0	0	0	480
Extensions of network (Km)	8	8	56	153	45	150	150	150	150	150	210	1,230
Renewal of network (Km)	4	4	4	54	23	0	0	25	25	25	25	189
Pumping stations	0	19	20	30	10	8	8	8	8	8	16	135
Connections	750	750	3,220	19,150	10,000	10,000	10,000	10,000	10,000	10,000	20,000	103,870
Master Plan	0	0	2	1								3

This investment plan will cover among others the followings:

- Increase the capacity of the WWTPs to 186, 909 m^3/day (representing 72.1 % of the total national plan for 2015);
- Increase the capacity of the FSTPs to 480 m^3/day (10.8 % of the plan for Senegal in 2025);
- Extent the network to 1,230 Km (55.2 % of Senegal plan in the target year);
- Renew a network length of 189 Km (representing 90.4 % of total network renewal plan for Senegal in 2025)
- Install a number 135 pumping stations (58 % of the national plan for 2025);

- Execute 103, 870 household connections to sewerage system (56.7% of Senegal for 2025).

The Figure 4 and Figure 5 show the comparison of the current existing ONAS' assets in Dakar with the projected investment programme of 2025.The capacity of the projected WWTPs in 2015 will be almost seven (07) times higher than the current existing ones

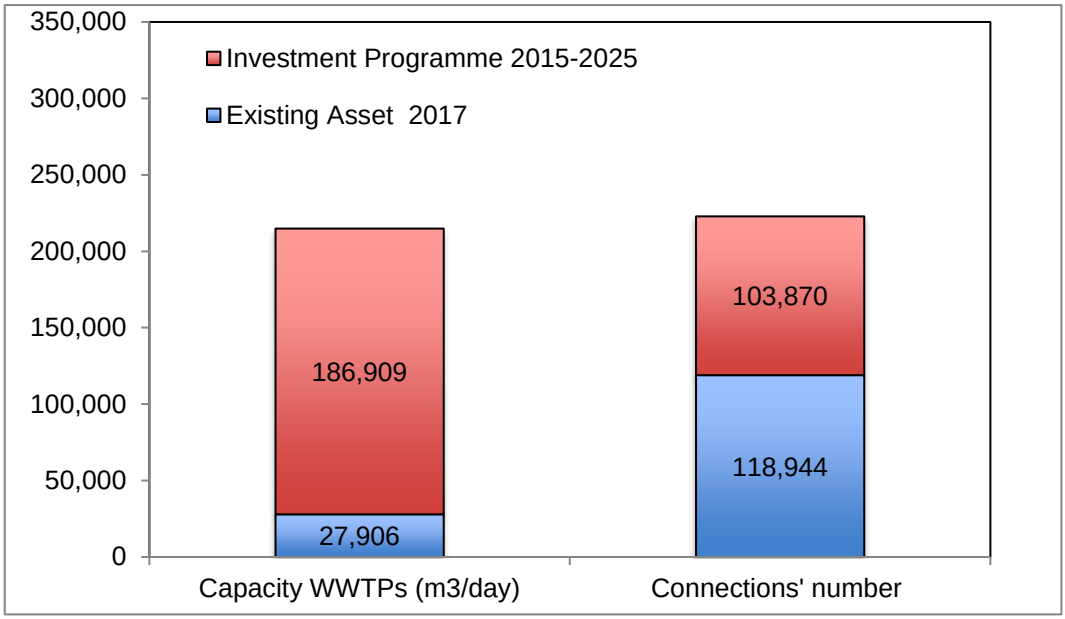


Figure 4: Comparison of the existing WWTPs' capacity and household connections with the investment programme: 2015-2025 for Dakar

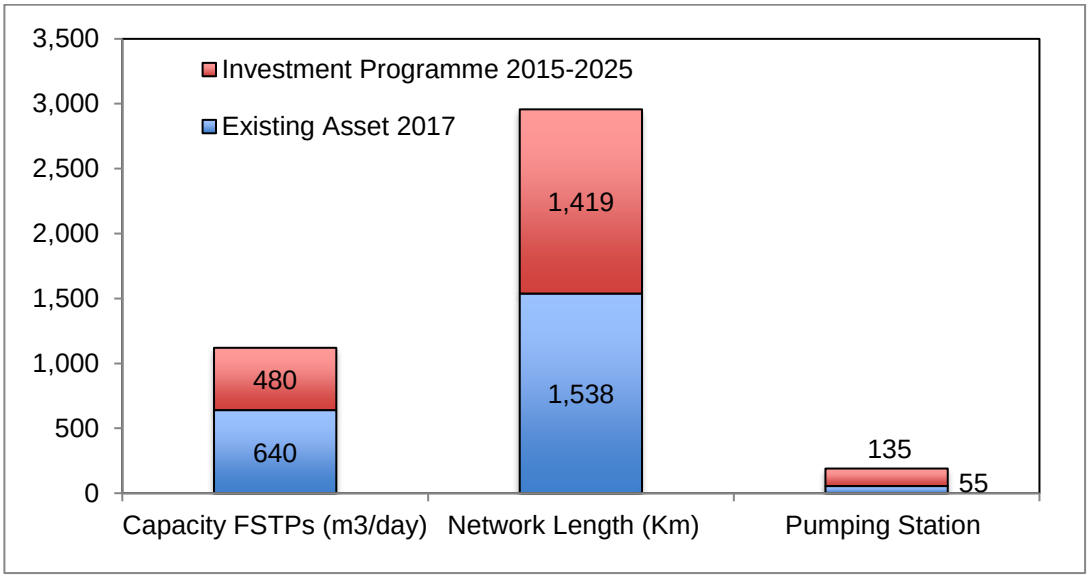


Figure 5: Comparison of the existing FSTPs' capacity, network length and pumping station with the investment programme: 2015-2025 for Dakar

C.4. Financing mechanisms of the projected sanitation plans by 2025

The Figure 6 represents how the investment programme of wastewater and human excreta for Dakar will be funded by 2025. A total amount of 373.164 billion will be necessary to achieve this above ambitious investment programme. This total required amount for Dakar is 62 % of the all-necessary amount (601.133 billions) that should be mobilized for other ONAS' Centers in Senegal for 2025. In Dakar, the sanitation authorities are seeking for 153.565 billion of funding (41. 2 %). Interestingly about 100 billion (26.8%) is planned to be obtained through PPP (Public- Private Partnership)

based contract. National Government will cover only 1.7 % of set budget. A large contribution from donors reached about 30 % of the total required amount for funding the investment programme for the target year of 2025.

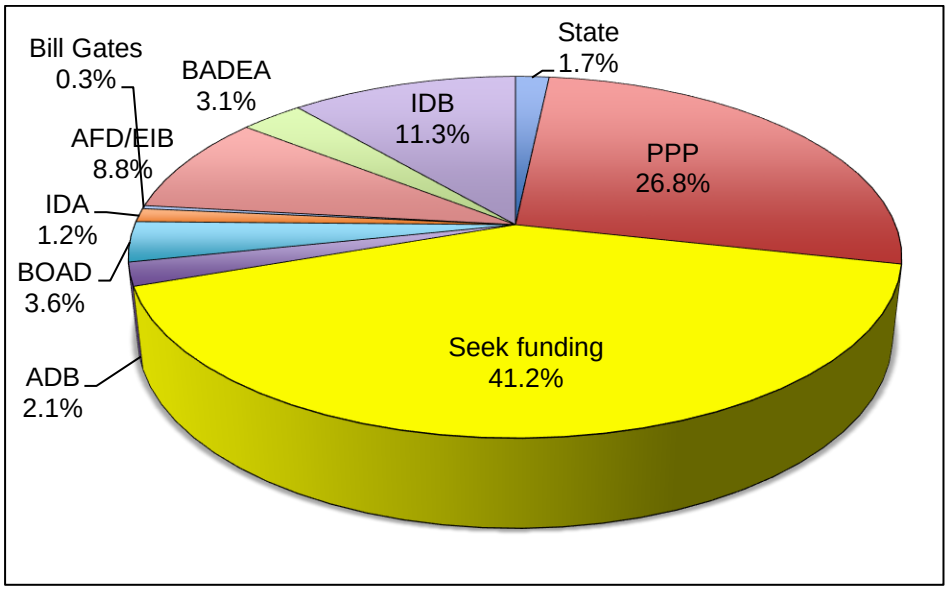


Figure 6: Distribution of funds to finance the investment programme for Dakar - 2015-2025

Considering the 26.8 % part that will be sourced from the private, the payment will done based on the normal market rate (Commercial rate) and the loan money will be repaid by the Government of Senegal (not from operating tariff fees of ONAS). The reason is that all infrastructure investments in Senegal are made by the Government.

Remark: The concessionary loans applied by international donors are much lower in interest rate but repayment periods are higher in comparison with the commercial rate in Senegal.

PART D: ANALYSIS FOR INCREASING FINANCE IN URBAN SANITATION

D.1: Identification of predominant types of sanitation in Dakar

In Dakar, the predominant types of sanitation are sewerage (classical or simplified sewer) and on-sites sanitation systems. Therefore, in this Report, the idea was to consider the financial analysis and the discussions on increasing financial flow for urban sanitation considering the Dakar case, based on these two (02) typologies. However, ONAS do not have an operating account for each of their urban centers including Dakar, but a general operating account for all urban centers of Senegal, where ONAS is intervening. Nevertheless, we could get officially from ONAS, their financial statement Report of 2016 and the balance sheet of expenses and incomes for Dakar. Thus, based on these two (02) references received documents, we prepared the financial operating analysis of ONAS in Dakar for the management of wastewater and human excreta (See Section D.2). Luckily from our interviews with the private sector, which works on FSTPs delegation and the ONAS' Faecal Sludge Management Programme's staffs, we could gather some more detailed financial information for the On-site sanitation systems discussions case (See Section D.2.3). The financial account for On-site sanitation systems started to be conducted recently from 2013 with the delegation of the FSTPs by ONAS to the Private sector.

D.2. Financial analysis of ONAS for Dakar urban sanitation

D.2.1. Measures financing gaps and obstacles for Dakar urban Sanitation

In Section, it was considered and confirmed by ONAS Administrative and Finance Director that, the share of Dakar (Dakar + Rufisque) represents about 80 % (79.5 %) of global activities in all urban areas of Senegal where ONAS is operating. In other words, all ONAS's infrastructures are mainly located in Dakar. And since, ONAS' reported us that there is no financial account for each of their 17 urban centers, where they are working (including Dakar) but as a global; we extracted the information for Dakar from the whole of the Senegalese urban centers financial account, by applying the above ratio of 80% on the validated financial statement of ONAS' Report for the fiscal year of 2016.

D.2.1.1. Stock analysis results of ONAS

The Table 7 indicates the analysis of the Stocks of ONAS in Dakar. It represents the existing stocks of materials and equipment's linked to the operation of ONAS in the fiscal year of 2016. In other terms these materials and equipment were available for the operation of ONAS at the moment, when this financial analysis began. The main stocks of ONAS was composed mainly by the connection materials, which covered a rate of 66 % of the total stock in 2016, with a positive variation of more than 18 % in between, and in addition to other miscellaneous.

Table 7: Financial stock analysis for ONAS.

ONAS' Stock Analysis						
Description of Items	National level – fiscal years		Share of Dakar & Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
Fuel	3 433 650	9 850 800	2 730 438	7 833 356	2,20%	4,53%
Materials of connections	74 138 464	143 485 346	58 954 907	114 099 547	47,57%	66,05%
Spare parts Plants, Pumping Station – Network	22 024 605	19 703 384	17 513 966	15 668 131	14,13%	9,07%
Spare parts cars / engines	4 168 258	1 560 015	3 314 599	1 240 524	2,67%	0,72%
Small equipment's and tools	17 390 264	15 258 568	13 828 738	12 133 613	11,16%	7,02%
Security stock material	34 700 629	27 389 203	27 593 940	21 779 894	22,26%	12,61%
Total values of Stocks	155 855 870	217 247 316	123 936 588	172 755 066	100,00 %	100,00 %
Provisions	-14 177 790	-17 438 046	-11 274 179	-13 866 734		
Net accounting values	141 678 080	199 809 270	112 662 409	158 888 332		

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.2. Receivables analysis results of ONAS

ONAS receivables analysis results are shown in the Table 8. The average tariff value for the sanitation tariff (which derived from the water supply bill, issued to customers every 2 months) is 63.3 F.CFA/ m^3 of water consumption. It represents the main sources of incomes for ONAS with a ratio of 96 % for Dakar (2015-2016). In order to increase its revenues and subsequently increase its financial capacity, ONAS is planning to review the average tariff between up to 80 F.CFA/m3. More so, the on-going study on the financial mechanism of ONAS even suggested an increase of 112 F.CFA/ m^3 for the renewal of equipment aged less than 15 years (Draft Interim Report, ARTERIA/EDE 2017).

Table 8: Analysis of receivables from ONAS' customers (2015-2016)

Analysis of receivables from customers						
Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
Sanitation tariffs	6 528 983 600	6 811 249 496	5 191 847 759	5 416 305 599	95,81%	95,92%
Promoter customers	35 520 876	35 520 876	28 246 201	28 246 201	0,52%	0,50%
Particular customer -Dakar	174 855 174	-	139 044 834	-	2,57%	0,00%
Rufisque's customers	20 715 206	-	16 472 732	-	0,30%	0,00%
Thiès'customers	15 613 223	-	12 415 635	-	0,23%	0,00%
Louga's customers	7 804 842	-	6 206 410	-	0,11%	0,00%
Kaolack's customers	6 422 655	-	5 107 295	-	0,09%	0,00%
Saint Louis's customers	5 894 214	-	4 687 079	-	0,09%	0,00%
Least perceived miscellaneous customers	18 237 538	19 033 863	14 502 490	15 135 728	0,27%	0,27%
Customers contribution on network extension	199 932	235 332 243	158 986	187 136 200	0,00%	3,31%
Net accounting values	6 814 247 260	7 101 136 478	5 418 689 421	5 646 823 727	100,00%	100,00%

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.3. Operating expenditures analysis results of ONAS

The analysis of the different operating expenditures of ONAS is presented in the Table 9. The personal expenses of ONAS in Dakar were accounted for more than 16 % and 18 % of the total charge for the fiscal years of 2015 and 2016, respectively. The consumption of energy (electricity and fuels) for 2016 represents 7.2%, which was not negligible on the operating cost (more than 2.9 billion). Interestingly, it was found that ONAS outsourced a lot part of its operation and maintenance to an external service (32% and 18 % respectively for 2015 and 2016). This latest part covered the highest ratio of all charge just after the expenses related to the personal.

Table 9: Analysis Operating Expenditures of ONAS (2015-2016)

Analysis of Operating Expenditures						
Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
Raw materials et Furniture	83 314 144	221 822 234	66 251 407	176 393 040	0,43%	1,07%
Variations of stocks	10 395 769	-61 391 446	8 266 716	-48 818 478	0,05%	-0,29%
Others purchases	1 963 965 556	1 840 119 965	1 561 745 410	1 463 263 396	10,16%	8,84%
Transports	89 272 530	81 311 315	70 989 516	64 658 758	0,46%	0,39%
Electricity and Fuel	-*	1 501 208 800	-*	1 193 761 238	-*	7,21%
External Services & Out-sourcing	6 136 471 320	3 690 859 584	4 879 721 994	2 934 971 541	31,73%	17,73%
Taxes and fees	301 511 677	2 467 662 111	239 762 086	1 962 284 911	1,56%	11,85%
Others expenditures	1 314 502 637	432 445 624	1 045 292 497	343 880 760	6,80%	2,08%
Personnel expenses	3 134 654 850	3 773 237 512	2 492 677 537	3 000 478 470	16,21%	18,13%
Depreciations	5 916 692 196	6 863 683 937	4 704 953 634	5 458 001 467	30,60%	32,97%
Financials fees	103 293 772	-	82 139 207	-	0,53%	0,00%
Others Taxes	283 105 086	5 000 000	225 125 164	3 976 000	1,46%	0,02%
Total expenses	19 337 179 537	20 815 959 636	15 376 925 168	16 552 851 103	100,00%	100,00%

*ONAS did provide us the General Balance sheet for 2015, which explains the lack of analysis of energy data for this year.
Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.4. Operating revenues analysis results of ONAS

As for the detailed analysis of the operating incomes sources of ONAS, it is indicated in the Table 10. Out of the grants and the non-ordinary activities, in term of operating incomes, the main activity of ONAS is concentrated on the sanitation fees (more than 95%) and the works from sewer connections (more than 3.5%) of the revenues generation. The by-products incomes generation shows a low rate less than 0.5 % (less than 50 million) in the operation activities of ONAS. In 2016, the revenues from the by-products was an amount of 29, 747, 082 F.CFA and distributed as follows:

- Sale of treated wastewater: 2, 731, 817 F.CFA (100 F.CFA/m^3 of treated wastewater);
- Sale of stabilized sludge: 14, 943, 281 F.CFA (500 F.CFA/m^3 of dry stabilized material)
- Sale of Faecal Sludge: 12,071,984 F.CFA (500 F.CFA/m^3 of dry faecal sludge)

Table 10: Detailed Analysis of the Operation Incomes Sources of ONAS (2015-2016)

Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
By-products	21 642 277	29 747 082	17 209 939	23 654 880	0,27%	0,35%
Sanitation tariff	7 911 119 576	8 324 379 696	6 290 922 287	6 380 774 655	94,97%	95,40%
Connections works	408 000 000	300 266 699	324 441 600	238 772 079	4.86 %	3.57 %
Accessories revenues	60 993 082	56 752 666	48 501 699	45 129 720	0,76%	0,67%
Revenues	7 993 754 935	8 410 879 444	6 356 633 924	6 688 331 334	100,00%	100,00%
Operating grants	2 576 016 512	2 657 567 106	2 048 448 330	2 113 297 363	67,32%	99,79%
Other products	1 250 240 267	5 612 639	994 191 060	4 463 171	32,68%	0,21%
Subsidies and others products	3 826 256 779	2 663 179 745	3 042 639 391	2 117 760 533	100,00%	100,00%
Reduction in the provisions	603 759 131	172 710 475	480 109 261	137 339 370	8,02%	2,34%
Transfer of expenses	29 607 210	0	23 543 653	0	0,39%	0,00%
Divestment proceeds	42 609 743	0	33 883 268	0	0,57%	0,00%

Product out of activities	444 441 429	0	353 419 824	0	5,91%	0,00%
Reduction of products out of activities	6 405 113 729	7 215 009 116	5 093 346 437	5 737 375 249	85,11%	97,66%
Others products out of activities	7 525 531 242	7 387 719 591	5 984 302 444	5 874 714 619	91,58%	97,66%
Total Incomes	19 345 542 956	18 461 778 780	15 383 575 759	14 680 806 486	100,00%	100,00%

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

The global analysis of the revenues distributions sources of ONAS is shown in Table 11. Sanitation tariff covered still remained the biggest part of the total ONAS' revenues with a ratio of 72. 4 %. While the grants represented a rate of 24 %, which is an important part of ONAS' source of revenues (2.1 billion F.CFA, 2016) that mitigated the operating deficit. These grants were mainly from the national Government of Senegal and others donors (technical and financial partners). More explicitly, these operating grants are composed by the financial support from the Senegalese Government for an amount of 203,200,000 F.CFA (57 %) and other part from the donors such as the Bill and Melinda Gates Foundation with a total of 910,097,363 F.CFA (43 %).

Table 11: Global analysis of operating incomes with grants and other products of ONAS (2015-2016)

Analysis of Operating Incomes with Grants and others incomes						
Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
By-products	21 642 277	29 747 082	17 209 939	23 654 880	0,18%	0,27%
Sanitation tariffs	7 911 119 576	8 024 112 997	6 290 922 287	6 380 774 655	66,93%	72,46%
Connections works	408 000 000	300 266 699	324 441 600	238 772 079	3,45%	2,71%
Accessories revenues	60 993 082	56 752 666	48 501 699	45 129 720	0,52%	0,51%
Operating grants	2 576 016 512	2 657 567 106	2 048 448 330	2 113 297 363	21,79%	24,00%
Other products	842 240 267	5 612 639	669 749 460	4 463 171	7,13%	0,05%
Total	11 820 011 714	11 074 059 189	9 399 273 315	8 806 091 867	100,00%	100,00%

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.3. Net Operating Results (NOR) of ONAS (2015 -2016)

The analysis of the net operating results of Dakar (Dakar + Rufisque), indicates a huge loss of – 1, 872, 044, 458 F.CFA in the fiscal year of 2016 (Table 12). This deficit is the result of a lack of operating capacity that could generate enough revenues to cover the important part of the expenditures of ONAS in Dakar. Similar deficit in net operating results is also found in other urban areas of Senegal. And by considering all the results of ONAS operation in all urban centers of Senegal, a deficit of nearly 2.5 billion was observed in the fiscal year of 2016. Therefore finding innovative financial mechanisms that are able to recover this unhealthy financial situation of ONAS and bring more new investments in the sanitation of urban areas should be one among other ideas to solve these issues in a sustainable way.

Table 12: Analysis of the Operating Results of ONAS (2015-2016)

Analysis of the Operating Results for the fiscal years 2015 and 2016				
Description of Items	Operating fiscal years		Shared of Dakar and Rufisque	
	2015	2016	2015	2016
Incomes	7 993 754 935	8 410 879 444	6 356 633 924	6 688 331 334
Expenditures	6 073 176 854	7 510 858 442	4 829 390 234	5 972 634 633
Added Values (AV)*	1 920 578 081	900 021 002	1 527 243 690	715 696 701
Gross Operating Profit (G.O.P)**	-1 214 076 769	-2 873 216 510	-965 433 847	-2 284 781 769
Operation Results	-6 497 402 624	-9 564 189 972	-5 166 734 567	-7 605 443 866
Financial Results	-103 293 772	-	-82 139 207	-
Net Operating Results	8 363 419	-2 354 180 656	6 650 591	-1 872 044 458

*Added Values (AV) = Incomes – Expenditures;
** Gross Operating Profit" (G.O.P): Incomes – Expenditures excluded depreciations and provisions.
Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.2. Identification of financing mechanisms for Dakar urban sanitation

To contribute to solving or mitigating these above financial gaps and obstacles (huge financial operation deficit, high subsidies from government and donors in the urban sanitation operation, low by-products generation from the sanitation facilities due to low performance of operation, unique operators remained the public authorities), the following financial instruments can be considered among others:

- Increase the Sanitation tariff

The planned increase of the sanitation fee, which is collected by ONAS from the Senegalese water supply company (SONES) might be one good idea to contribute in the reduction of these above ONAS' operation financial gap and obstacles. This increase of the sanitation tariff is stipulated in the performance contract (2016-2018) between the State and ONAS. Actually the rate of the sanitation fee is 63.3 F.CFA/ m^3 of the consumed water supply and the increase plan is rated to 80 F.CFA/m^3 in 2018.This increase of the sanitation fee could impact on the total revenues of ONAS' operation and subsequently mitigate its financial operation deficit.

- Pollution tax:

Industrial companies must support this tax. Indeed, they represent the biggest wastewater producers and therefore the main customers of ONAS on the sewerage systems in Dakar. Therefore, they should pay some additional fees to ONAS to mitigate its total expenditures. This tax could be grafted to these companies from the water supply sanitation fee that they are already paying to the drinking water company. Hence, the actual sanitation levy will be revised upward especially for industrial producers.

- Sewerage Connection tax

This sewerage connection tax will be paid by property developers, when they apply for building permits. The building areas must be linkable to the ONAS sewerage system for the tax to be applicable. The criteria that will be used to calculate the tax could be the construction surface. The payment will be made to ONAS, which will deliver a discharge that will allow the promoter to get a building permit.

- Gradual Reduction of subsidies

The subsidies represent a non –negligible portion in the management of ONAS (24 % of the total revenues in 2016). In the viewpoint of sustainability, this could be a concern, because the operation of this public institution should be self-independent. In other words, ONAS should operate without relying on such subsidies by optimizing its revenues such as sanitation fee, incomes from by-products etc. Therefore, the gradual reduction of these subsidies should be considered in the future as a sound and sustainable operation of urban sanitation management.

- Increase incomes revenues of the business of sanitation

Product generated from operation of the sanitation facilities (by-products) such energy, water, and fertilizer should be more promoted at the National level. Because the current income generation from the by-product (sale of treated water and sludge's) are still very low and accounted for less than 1% of the total revenues of ONAS. Technology orientation to good and high quality of by-products with lower operating cost could be one idea. The increase in revenues from by-products could cover some important part of the financial operating deficit.

- Involvement of wide actors in the sanitation sector

Another steady and sustainable sources of incomes is to involve national private sector in the management of urban sanitation facilities in order to create more revenues and provide a better management. And that is understood by the sanitation public authorities of Senegal because in the projected financial mechanisms of ONAS by 2015 it is planned 100 billion investment through PPP (Public- Private Partnership) models. This optimistic plans are supported by various Laws including the recently adopted PPP Law of 2014, which stipulates the reinforcement of the alliance private and public sectors in order to develop innovative financial mechanisms for the sector. Furthermore, among actors the involvement of the municipality in the management of wastewater and human excreta, should be also considered.

D.2.3. Examples of innovative financing instruments on the management of faecal sludge in Dakar

D.2.3.1. Background of these innovative examples of financial mechanisms

On-site sanitation is the predominant system used in Senegal for the management of human waste. In the Departments of Pikine and Guediawaye (Dakar, Senegal) the population was estimated at about 1, 200,000 people (2011), and around 80 % of them were relying on on-site sanitation. As a result, a significant amount of fecal sludge was produced daily in these Departments (1500 m^3/day). More so, as the groundwater is shallow in many parts of these areas (intrusion of groundwater into containments especially in rain season), domestic pit-emptying frequency is relatively high with an average of twice in a year. Furthermore, people often had difficulties to get access to emptying trucks when needed. And due to the lack of competition between emptying operators, the cost of the mechanical emptying was unaffordable (65,000 F.CFA/year/household /emptying) for a large segment of the population (where the vast majority live with less than USD 2 /person/ day). Thus, manual emptying became widespread and 52 % of population used such kind of practices. Therefore, to address these issues, ONAS with the financial support from the Bill & Melinda Gates Foundation has set up the "Program for the Structuring of the Faecal Sludge Management Market for the Benefit of Poor Households in Dakar Suburban Areas (PSFSM)". The General Objective of this programme is to improve the living conditions of low-income people living in the peri-urban areas of Dakar (Pikine and Guediawaye), by facilitating access to hygienic and affordable sanitation services. More specifically the program aims to:

- Organize the FSM sector: Organization of emptiers, implementation of licence, delegation of the sludge treatment plant to private sector and researching about innovative sanitation technology adapted to flooded and flood-prone areas of the peri-urban of Dakar;
- Decrease the cost of mechanical emptying: Introduction of a Call Center to foster competition among the emptiers, construction of new FSTP closer to areas of FS production and implement a guarantee fund allowing emptiers to access to fund for renewing or rehabilitating their fleets of truck.
- Transform sanitation into a real market through reuse of FS: Commissioning of the Omni-Processor (OP), which generates water, amendments and energy as by-product.

The total project cost has a value of about 8.3 billion F.CFA (USD 18,370,007) which is entirely funded by the Bill and Melinda Foundation and for a duration of nearly seven (07) years (November 2012 - March 2018). In this program ONAS with its partners (Bill and Melinda Gates, WSA, IPA, Oxfam, private sector and Association of emptying operators and) has developed three (03) different interesting financing mechanisms (1- delegation of the management of FSTPs in Dakar to private sector, 2- implementation of guarantee fund for pits emptying operators in Dakar to get access to credits from bank and at lower rate, and 3- development of toilet market in Dakar to increase the access rate to sanitation), that could be shown to other countries as good examples in the management of human excreta. Among these above financing instruments on the management of faecal sludge, this report discussed only the delegation of the FSTPs to private sector (as Example and the implemented guarantee fund for pits emptying operators.

D.2.3.2. Example 1: Delegation of FSTPs to Private Sector

The overwhelming majority of the Dakar population (over 75%) uses on-site sanitation systems for the management of domestic wastewater including human excreta. This resulted in large production of sludge, which was estimated at

about 1,500 m^3/day (Dakar Master plan 2013). Most of these sludge productions were collected by pit emptying trucks and one portion was collected through Manuel emptying, which consists of digging a hole outside the house and put the emptied sludge in. Thus, to control these illegal dumping, three (03) different FSTPs (Camberene, Niaye and Rufisque) with a total capacity of 240 m^3/day, were constructed and managed by ONAS (ONAS, 2012). Many challenges had been identified and most importantly the advanced deterioration of equipments and the lack of good operations and maintenance of these FS facilities. The Table 12 shows the financial results of the FSTPs in Dakar prior to the delegation of the management to the private sector. From these results it was found that the operation of the FSTPs in Dakar was profitable for Camberene (22.86 %) and Rufisque (16.37 %), while showing a significant loss for Niayes (-41.81%). The distribution of expenses is presented in the Figure 7 and shows that almost 60 % of the expenses were deriving from personnel cost.

Table 13: Results of the Dakar FSTPs' financial situation before the delegation of the management to the private sector

Results of 2012	FSTP of Cambérène	FSTP of Niayes	FSTP of Rufisque	Total
Expenses* (×1000 F.CFA/year)	23,253.60	21,504	18,954	637,11.60
Incomes (×1000 F.CFA/year)	30,146.40	15,163.96	22,662	679,72.36
Operating Results (×1000 F.CFA/year)	6,892.80	-6,340.96	3,708	4,260.76
Profitability Rate (%)	22.86%	-41.81%	16.36%	6.27 %

*These results did not consider in the expenses portion the depreciation and the ONAS taxes.
Source: ONAS, 2012

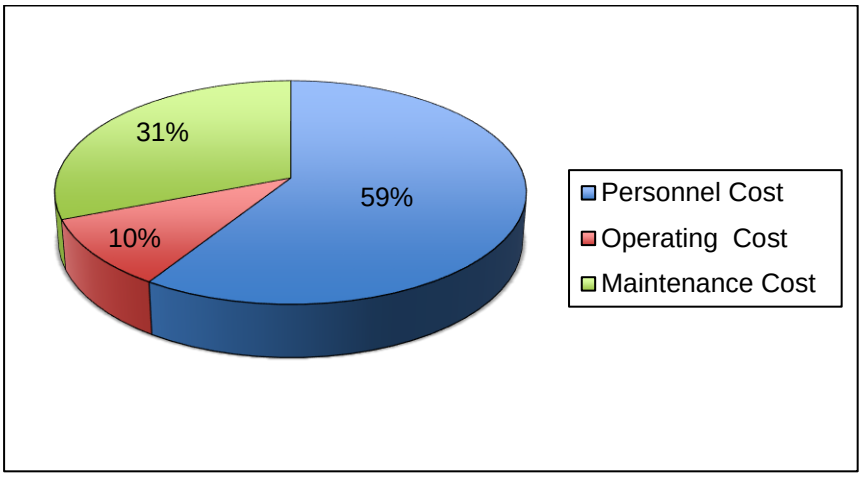


Figure 7: Distribution of expenses of FSTPs in Dakar before the delegation

Discussing deeply these results obtained before the delegation (Table 13), interestingly found that even with a bad provision of FS Services, ONAS could get a net annual profit of 4, 260, 760 F.CFA in 2012. However, it is highly important to mention that the obtained values (Table 13) did not include the expenses related to depreciations and other financial fees such as company taxes. Subsequently, if these expenses were considered, the obtained results would have been lower than these values.

In total, prior to the delegation the operation of the FSTPs in Dakar was financially profitable with a net positive annual result of 4, 260, 760 F.CFA. But in contrast, the operation did not respect the technical and environmental norms associated with these facilities. In addition, the poor maintenance of such facilities was another serious concern for the public sanitation authority.

Considering all these above challenges and poor quality of the services offered in these facilities, ONAS with the financial support from the Bill and Melinda Gates Foundation decided to entrust the FSTPs to the private sector. Therefore, the objective for ONAS was to involve the private sector through PPP model in order to make the FS sector: 1) Technically and financially viable, 2) environmentally compliant with existing regulations and 3) socially acceptable.

In other words, ONAS encouraged the private sector to invest in the sanitation and more specifically in faecal sludge sector.
This was the first time in Africa that the application of principles of delegating FSTPs to private sector has started

- Methodology

To build a sound public private partnership a procedure of three (03) different steps were set by ONAS:

- Study of possible options for FSTPs delegation to the private sector (the delegation of public sanitation service is governed by various existing laws in Senegal);
- Define rights and obligations of stakeholders;
- Selection of the private operators with best bid.

Based on several analyses such as financial, administrative and environmental conditions prior to the delegation (challenges in the FSTPs management, advanced deteriorations of facilities and equipment, low or absence of profitability and lack of recycling systems), a seven (07) years concession contract basis was set by ONAS for the management of the existing FSTPs in the Region of Dakar. This option was profitable for both public authorities and the concessionaire simply because, the public would not bear the necessary investment for the rehabilitation of FSTPs, and the private operator would be able to spread cost over a relatively long period. All FSTPs in Dakar (03 in total, in 2013), was delegated to one single private sector.

- Results of the delegation of Dakar's FSTPs to private sector

Multiples positive results have been achieved since the delegation of the Dakar Region's FSTPs to private sector:

Technical aspects:
In the technical point of view significant improvements of the management of FSTPs in Dakar Region were reached by the delegation:

- Upgrading of all FSTP facilities, in accordance with mutual obligations specified in the concession contract;
- All FSTPs (03) in Dakar are currently operating at their normal stage even if they received 6-7 times higher volumes of faecal sludge (Figure 3) than their nominal capacity (240 m3/day). In other terms a better quality of service is currently being provided by the private sector for the sound management of the faecal sludge facilities in Dakar;
- Increasing hours of operation (16 hours/week) compared to ONAS management (14 hours/week), which led a reduction of illegal dumping and the development of a market for dried sludge;
- Etc.

Social aspects:
Prior to the delegation the workers at FSTPs in Dakar was badly considered at the point that no one want to do such kind of jobs. This view of workers in sanitation has started changing. The current workers at the FSTPs are receiving good treatments because of the delegation:

- Increase of their salaries between 13-60 % depending on their positions;
- Monthly payment of their salaries at due time;
- Solve the issue of late payment of social contribution for retirement.
- Reduction of weekly working time from 52 to 48 hours;
- Availability of paid vacation for the workers (1 month off out of 12 month);
- Availability of enough Personnel Protective Equipment (PPE) for workers.

Financial and Economical aspects:
The financial situation after two (02) years of delegation of the Dakar's FSTPs to private sector is summarized in the Table 14. The total net profit for the 1st (2013-2014) and 2nd (2014-2015) years of operation were respectively 14.463 million and 12.768 million, which was significantly higher than the value obtained before the delegation (4.260 million). The profitability rates for the 1st (11.5 %) and 2nd (7.9 %) years of operation in comparison with the value before delegation (6.2 %) showed similar tendency with the annual net profits. Therefore, the delegation of the FSTs in Dakar causes a healthier financial situation compared to the case where public (ONAS) was performing the management. This is also corroborated by the results obtained from the FSTP of Niayes, where significantly high loss (-41.8 %) was observed prior to the delegation, and after the delegation the negative financial situation was recovered with a net positive profitability rate (2.7 %).

Table 14: Results of the financial situation of the FSTPs in Dakar after the delegation of the Management to private sector.

Results	FSTP of Cambérène	FSTP of Niayes	FSTP of Rufisque	Total
	Period: 2013-2014			
Expenses* (×1000 F.CFA/year)	34,581.52	39,165.39	32,262.84	106,009.76
Incomes (×1000 F.CFA/year)	49,394.40	35,951.10	40,197.65	125,543.15
Operating Results (×1000 F.CFA/year)	11,080.13	-2,567.70	5,951.11	14,463.54
Profitability Rate (%)	22.43%	-7.14%	14.80%	11.52%
	Period: 2014-2015			
Expenses* (×1000 F.CFA/year)	47,368.78	51,482.87	43,847.05	142,698.70
Incomes (×1000 F.CFA/year)	53,742.58	54,016.16	53,789.64	161,548.37
Operating Results (×1000 F.CFA/year)	4,389.91	1,479.22	6,899.40	12,768.53
Profitability Rate (%)	8.17%	2.74%	12.83%	7.90%

*These results include at the expenses portion the depreciation and private company taxes.
Source: ONAS, complied by SenEngineering International S.A.

The Figure 8 and Figure 9 show the distribution of expenses following the 1st and 2nd year of the delegation in all Dakar FSTPs. The maintenance costs in the 1st (52 % of the total expenditures) and 2nd (41 %) of was higher than the rate obtained prior to the delegation (31 %). Similar results were found with the operating cost (15 % for 1st year, 18 % for 2nd year and 10 % before delegation). One reason for these interesting results might be the increase in sludge volume received at FSTPs (Figure 3) at a level of 6-7 times higher than their total capacity (240 m3/day), which led to the increase in operation and maintenance of the facilities. As for the personal cost after the delegation (33 % for the 1st year and 41 % for the 2nd year) in comparison, it has decreased significantly in comparison with before the delegation (59 %), while better conditions for workers were made.

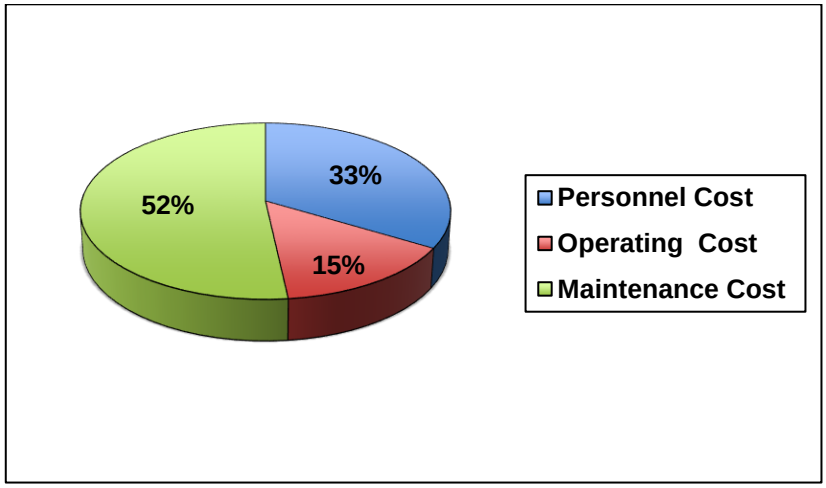


Figure 8: Distribution of expenses of FSTPs in Dakar 1 year after the Delegation (2013-2014)

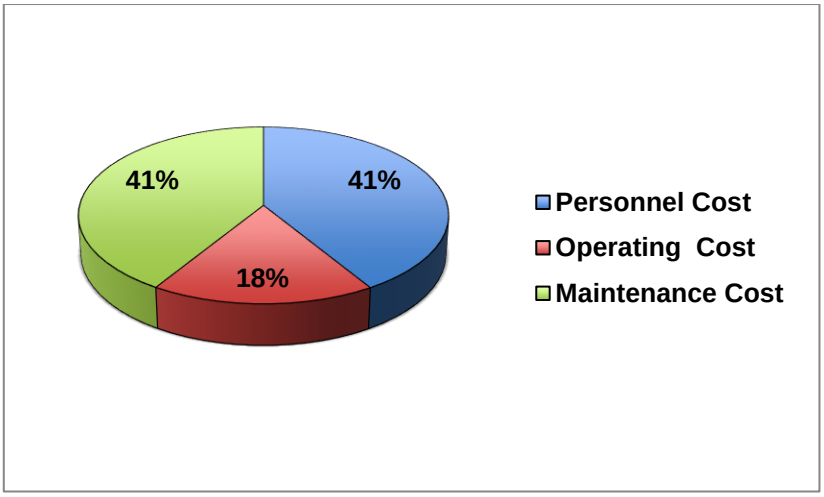
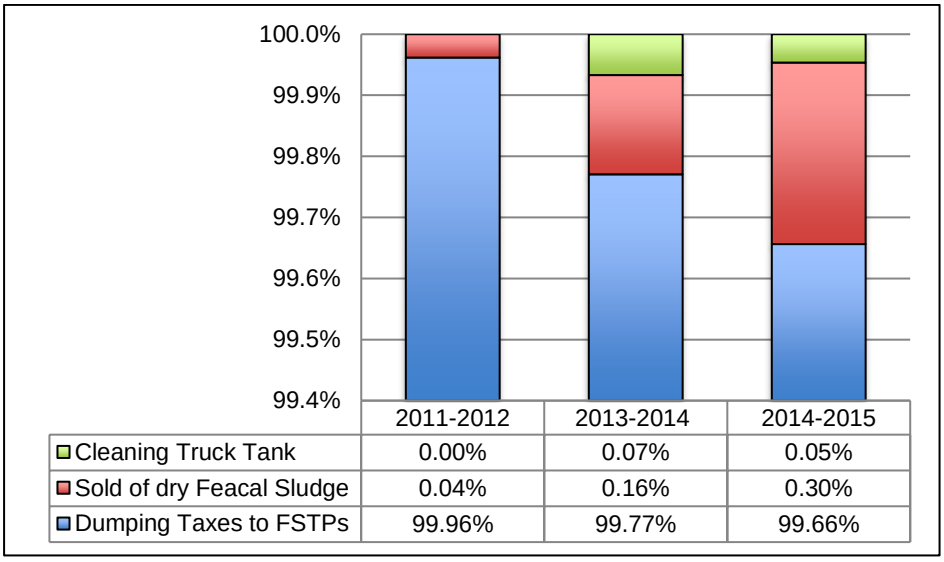


Figure 9: Distribution of expenses of FSTPs in Dakar 2 years after the Delegation (2014-2015)

The main sources of incomes generated from the management of FSTPs in Dakar are discussed in the (Figure 10). In the FSTPs of Dakar, all the revenues (more than 99 %) come from the dumping taxes (300 F.CFA/m^3) regardless whether considering before or after the delegation. Nevertheless, the private sector, is trying to diversify the revenues sources with the sale of dry faecal sludge (500 F.CFA/m^3) and cleaning the pit empting truck tank, even if a lot of efforts need to be done in this sense.



	2011-2012	2013-2014	2014-2015
Cleaning Truck Tank	0.00%	0.07%	0.05%
Sold of dry Feacal Sludge	0.04%	0.16%	0.30%
Dumping Taxes to FSTPs	99.96%	99.77%	99.66%

Figure 10: Distribution of Incomes generated in the Management of FSTPs in Dakar.

Regarding the incomes, the distribution of the net profit generated from the management of FSTPs between the public authority and the private sector before and after the delegation is presented in the Table 15. The concession contract between these parties stipulates a 50 % net revenue shared for a duration of seven (07) years (50% ONAS and 50% private sector). From the results in the Table 9, before the delegation ONAS had Net revenue of 4.260 million. After the delegation the total net revenues to be shared were 14.463 million and 12.768 million, respectively for the 1st year 1 (2013-2014) and 2nd year (2014-2015). In other words, after the delegation each party received a profit of 7.231 million (1st year) and 6.384 million (2nd year). The ONAS's portion after the delegation always includes the payment of the annual licence fee (1,146, 160 F.CFA to be paid at the beginning of each year) and the annual operating fee (3, 438, 468 F.CFA, which is equivalent to 286,539 F.CFA/month).

Table 15: Distribution of shared net profit between ONAS and the private sector before and after the delegation

Organization / Institution	Net shared profit distribution		
	Before delegation	After delegation	
	2012	2013-2014	2014-2015
Private portion (F.CFA)	0 (0%)	7,231,769 (50%)	6,384,263 (50%)
ONAS' portion (F.CFA)	4,260,760 (100%)	7,231,769* (50%)	6,384,263** (50%)
Total	(100 %)	(100 %)	(100 %)

*4, 584 628 FCFA (annual licence fee + annual operating fee) + check of compensation de 2,647,141 F.CFA issued by the private; ** 4, 584 628 F.CFA + check of compensation of 1,799,635 F.CFA issued by the private.
Source: ONAS, complied by SenEngineering International S.A.

From this section it could be retained that, the financial situation of the management of FSTPs in Dakar is significantly improved with the delegation. The public authority gains more revenues with a better a quality of service at the FSTPs. The private sector also finds out more in the set business. Moreover, the private makes more profit and manage better than public authority.

- Lessons learned from the Delegation

The lessons learnt from the Delegation of the FSTPs in Dakar to private sector reveal the following:

- the private sector has been really efficient in the management of the FSTPs ;
- the public authority (ONAS) takes greater advantage from the concession compared the public management (better operation of facilities and increases increase in net profit) ;
- the delegation of FSTPs in Dakar is a financially sustainable delegation model;
- the FSTPs delegation model is technically, socially, economically and financially accepted in Senegal. Therefore, it is a sustainable model;
- the Senegalese sanitation authorities are preparing for scaling up the Dakar model at the country level because of the obtained successful results. The technical and financial partners (Gates Foundation, AFD, etc.) are being more and more interested in such model and are ready to support the scaling up.

Conclusions:

In conclusion we can retain that the delegation of the FSTPs to private sector have resulted in a great achievement which includes the renovation of FSTPs, the increasing hours of operation (16 hours/week), the improvement of social conditions of FSTPs' personnel, the reduction of illegal dumping and the development of a market for dried sludge. This turn led to an increase in revenues generation for the public and private, better provision of quality services, and creation of green job opportunities. Based on these interesting results, the Senegalese Government has decided to delegate the management of all FSTPs in Senegal to private sector since they have a high capacity to generate more revenues (healthy financial conditions) and provide better services in comparison with the public management. Therefore, the Dakar' delegation of FSTPs to private sector is a unique experience in Africa that need to be shared with other countries as good examples of the involvement of the private sector in form of PPP for the sound management of urban faecal sludge.

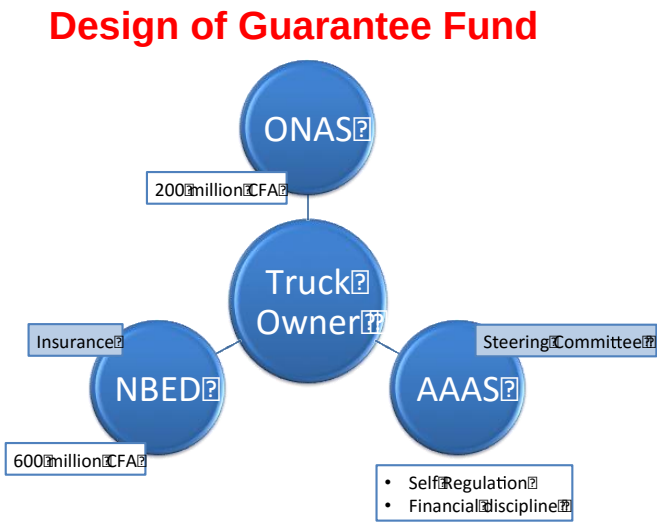
D.2.3.3. Example 2: Organisation of mechanical pits emptying operators

The guarantee fund (GF) could be defined as an amount of money pledged as a contingent for loss, to pay investors if a debtor company is unable to pay. Prior to the ONAS' FSM Program, it was found in Dakar that emptying trucks were old (unfit to business and cause health and environmental problems) and had a high operating cost (maintenance and fuel cost accounted about 50% of the operating cost). These emptying companies had limited resources and difficulties in accessing bank credit. Conscious of these above drawbacks, the program under its Research and Restructuring Markets Component established a guarantee fund to decrease the financial burden of emptying operators companies in order to increase mechanical emptier's incomes. The specific objectives of the guarantee fund are 1) to develop a market to meet emerging demand by providing access to loans for renewal of their fleets or acquisition of spare parts 2) Reduce the service cost by lowering the O&M costs 3) Mitigate the risk of the credit agencies.

- Design of the Guarantee fund

The guarantee fund is established to promote the development of emptying companies in Dakar through facilitating access to credit for renewal of their emptying fleet trucks and /or acquisition of spare parts. The schematic design of the emptiers guarantee fund and the detailed process for the acquisition of the fund is presented respectively in the Figure 11 and Figure 12. ONAS and Bank agreed on a deposit of 800 million in the selected Bank (NBED) as a guarantee fund with a respective portions of 200 million and 600 million each, in order to ease emptiers for accessing to credits at the bank at good conditions. The sharing of risk concerned the three (03) parties, who are 1) the credit institution, 2) the guarantee fund and 3) the beneficiaries of the guarantee fund, which refers to emptier. The financial instrument required a good organization of the actors, that is why the structure of governance in Figure 11 was defined by the different stakeholders (ONAS, Bank, AAAS and Truck owner). It is a requirement that the truck owner (privates companies) should belong to the Association of emptier (AAAS) before pretending to have access to a credit, which is on way of formalizing the sector. To ensure a proper operation of the guarantee fund ONAS, a steering committee has been set up by and composed by the following members:

- ONAS' faecal sludge programme staffs (Coordinator, Financial manager and monitoring and evaluation expert) as well as the administration and finance its headquarter directorate;
- Representative of the Ministry of hydraulic and sanitation;
- Representative of the AAAS;
- Two representatives of selected bank.



"NBED": National Bank of Economical Development
"AAAS": Association of Sanitation Actors in Senegal

Figure 11: Schematic design of the guarantee fund

- Fund floor - Process

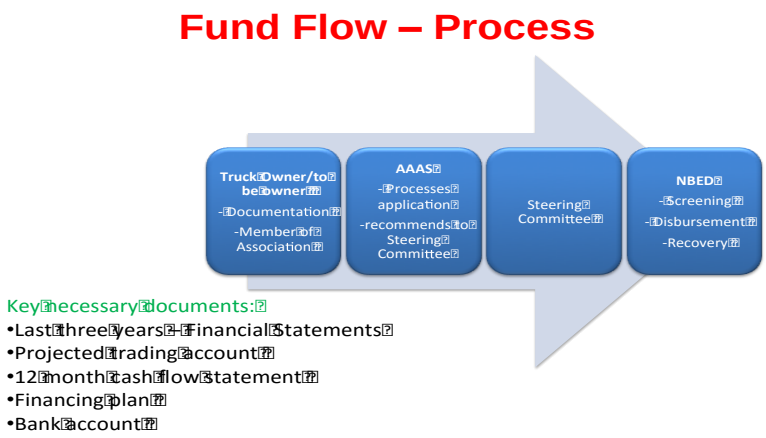


Figure 12: Guarantee fund chart flow process

For granting the loans to emptiers, the steering committee adopted the following strategies: 1) the loans applications are officially made by each borrowing emptier, 2) the bank a link the emptying truck and 3) each borrower signs an agreement with the emptiers's association who reserves the right to recover and entrust its operation with another emptier, in the event the emptier fails to repay its credit.

- Details specifications on Guarantee Fund Operations

The detailed description of the Guarantee Fund (GF) modalities for the emptying operators in Dakar is shown in the Table 15. The total amount of the guarantee fund is 800 million F.CFA. This amount was constituted based on the contribution from ONAS (25 %) and the Bank (75 %). A fixed interest rate of 7.5 % is agreed with the bank, which is significantly low in comparison to the usual interest rates of applied in Senegal (12 -13 %).

Table16: Specific information on the Guarantee Fund for the emptying operators

No.	Designations	Resulted Operations from the GF
1	Total amount of the guarantee fund	800 Million F.CFA (1.6 million USD)
2	Risk coverage	25% (GF) and 50 % (insurance)
3	Average loan amount for new truck	20-25 Million F.CFA/ beneficiary
4	Average loan amount for upgrading	5 Million F.CFA / beneficiary
5	Fixed interest rate	7.5 % (6.5 % banks + 1 % insurance)
6	Loan tenure	6 years with a grace period of 6 months
7	Late payment charge	Less than 3 %
8	Ratio of the current beneficiary	29 beneficiaries out of 38 Applications

Source: ONAS, complied by SenEngineering International S.A.

- Current important results on the guaranty funds

From the results of the conducted interview with the Bank, ONAS' PSFSM and the Association of Sanitation Actors (AAAS) in Senegal, the current following results on the guarantee fund were collected and confirmed by all of these stakeholders:

- the execution rate of guarantee fund is counted for 76 %;
- the Bank has financed 29 applications out of 38;
- a total number of 29 emptying trucks (01 truck per applicant) have arrived in Senegal from Europe and all them are currently operating in Dakar;
- the remaining 9 applications are under processed by the steering's committee and the bank.
- the non-performing loans (NPL) are rated to 8 %, which is low because of lack commitment of the beneficiaries. However, according to the beneficiaries (services providers) these delays in payment of the loans will be fixed shortly through theirs annual business with religious cities in Senegal. These religious cities organize several annual events and since they are not connected to sewer line and the needs of emptying services become annually a big market for them.

- Impacts of the Guarantee fund on the FSM Program

The guarantee is highly relevant for many urban areas, states, and sectors. It's a progress step for promoting FSM Market for an inclusive market. Impacted results of the guarantee fund on the FSM Programme of ONAS is summarized as follows: 1) the used strategies fit within the overall FSM Programme 2) helped in developing the FSM market by increasing fleets to meet emerging demand 3) Promote mechanical emptying 4) lowered interest rates and increase incomes of the services providers (12-13 % to 7.5 %) 5) Self-regulation through the Association of Sanitation Actors.

- Lessons learnt from ONAS guarantee funds:

Considering the ONAS' guarantee fund the lessons learnt are captured in this section and as follows:

- promote financial discipline and professionalize the sector (bank account, tax, and balance sheet);
- for long term sustainability – equity contribution may be considered;
- increasing financial literacy of the steering committee and beneficiaries members;
- potential for scaling up and replicable but communication is necessary to increase the loan recovery rate (because of a NPL of 8 % was reported a result by the bank);

- Recommendations on the guarantee funds:

From these above analyses on the guarantee fund, it could be recommended the following:

- the guarantee fund (financial instrument) is a good way to formalize informal markets;
- the guarantee fund could be used to provide access to financial services for the private companies to effectively provide better sanitation services in cities;
- the guarantee fund is applicable to many sectors including sanitation in itself.

Based on these results, it could be concluded that the guarantee set up by the Bank, the emptiers association and ONAS is a relevant mechanism because it removes one of the main hindrances to the financing of the actors in the sanitation sector, namely guarantees. However, a guarantee fund is not a gift, the beneficiary must be involved in a certain proportion to cover costs that will allow to capture resources. Thus it is a viable model, if there is compliance with the commitments of beneficiaries but also to put a rate of remuneration for this guarantee that the beneficiary will have to support. This rate is usually called a guarantee fee that ranges from 1.2% to 2%.

D.3. Opinions on increasing financial flow on sanitation

This section summarized the different opinions collected during interviews and relates to increasing financial flow of sanitation:

Technical point of views:

- Introducing new technologies that could create more added values in the reuse of faecal sludge. The produced by-products from such facilities should be generated at lower operating cost and have a high market values (sealable products);

Economical points of views:

- In Senegal, the sanitation sector is kind of more social than profit orientation. And the classical way which consists of receiving only loans from donors in order to invest in building new sanitation infrastructures to meet the demands of infrastructures is not sustainable. Because, applied procedures and regulations from these classical donors are very heavy, and the lending amount usually insufficient for the sector. More so, the concessionary loan offer (2-3%) in a long period (15-20 years), that the Government needs to reimburse could be a continuous challenge because continuous investments generally require to meet the continuously wider gap between investments and the demands in facilities. Maintaining existing sanitation facilities is another issue and the deriving costs are not negligible. Therefore, to address these described challenges above, the mixture of investments from both donors and innovative finance instruments, with a more special focus on the latest one is a key. Among the innovative financing mechanism, the provision of finance in a commercial based form "Commercial offer", where the private sector intervenes into the sanitation sector,

invests, constructs and (optional) operates the facilities, and in reverse the State reimburses the investment with a fixed agreed period. Such kind of new commercial financing instruments shall involve the local private sectors. And finally another sustainable innovative mechanism is to create strong local private companies which could capture sufficient funds and invest in sanitation infrastructures to generate useful and reusable by-products for the benefits of all (private sector State, population etc.).

- Increasing financial flow in sanitation could be reached through considering the following: 1) formalize or organize the different actors (city sanitation service providers) so that they can produce stable and reliable financial information, 2) provide financial education to these actors and reinforce their bankarisation rate, and 3) gather these actors within a cooperative, to federate their interventions into the banking sector to increase their benefits as well as those of the external donors (i.e. Government, Strategic technical and financial partners etc.)

- Providing assistance to private sector to have funds, perhaps through loans from Banks, Institutions or states at a lower rate (5-6%) with a long enough repayment period (10-15 years), for not optimizing the operation of wastewater and faecal sludge treatment plants and create more revenues, but also build and operate by their own new facilities (Build and operate schemes application). This is possible only if the mechanisms put in place are supported by a guarantee fund.

Legal points of views:

- Implement favourable legal and regulated environment, which facilitate access to funds and secure transactions for the private sector, is required to increase financial flow for sanitation

Social and cultural points of views:

- Generate useful by-products and that are culturally accepted to promote sound circular economy.

Annexe 1: Interviewed Actors / Summary of Interviews

No.	Nom	Institution/Organization	Contact	Date
	Abdou Diouf	Director/EVE	(221)774506443 abdoudiouf@eve-sn.org	04/11/2017
1	Abdou Diouf is part of the team of EDE and ARTELIA that made the study on ''identifying sustainable financing mechanisms in the sanitation sub-sector'' for ONAS in October 2017. • Sanitation is managed by the State that sets up its policy through ONAS which is responsible for sanitation in Dakar. In relation to sanitation there is no responsibility dedicated to the city. • ONAS has two guardianships the Ministry of Finance and the Ministry of Hydraulics and Sanitation, the guardianship of the Ministry of Finance can be questioned, with the finance program the Ministry of Finance will no longer be the only expenditure authorizing institution (WAEMU reform). The communication between decision-makers in the sector Communication is done at the level of the following instances: • The semi-public sector advisory Committee, which allows ONAS to address its concerns. • The technical commission at the national assembly is also a forum for exchanges that allows actors to express themselves. • The actors can also communicate during the preparation of the finance law by the Ministry of Economy and Finance			
	Dieynaba Thiam KA	Dakar's Municipal Finance Program	(221)778116657 dieynabathiam@villededakar.org	06/11/2017
2	• Mrs. KA is in favor of setting up of guarantee funds like the FIN WASH and the BLUE FUND, which are rather innovative financing mechanisms. FIN WASH, for example, is committed to supporting private operators to fill funding gaps in order to achieve universal access to water and sanitation services through viable and reliable management models. Ms. ka thinks it is necessary to: • Make a market-based approach. Make private operators independent and solvent. Institutions like AFD are doing a good job in this direction by giving guarantees with rates of 7 to 8%. • strengthen the financial viability of service providers and establish a sound financial base to increase public investment and access to private sector financing by local banks, municipal bonds or joint financing mechanisms -There is a need to advocate for increased and monitored public investments -Use mixed financing opportunities, public-private partnerships, local debt financing, development funds and other viable financing models that can be replicated and scaled up in target countries -Leveraging domestic capital markets and host government funds, grants from foundations, multilateral investments in development banks, and private sector participation in shares and debt financing, in order to mobilize investment expertise and access capital market -The delegation of fecal sludge treatment plants must be emphasized in order to give more resources to private operators.			
	Moustapha Lo	ONAS'FSM PROGRAMME	(221)77 579 34 12 Moustapha.lo@onas.sn	13/11/2017
3	• Before the delegation, there was a deficit management of sludge treatment plans with a staff working in laborious conditions. • With the delegation, there is an optimized management of the sludge treatment plants that have become financially more profitable for ONAS and for operators in the sector who pay to ONAS a monthly fee in addition to license which is paid at the beginning of the year. The staff benefits from better salary treatment and good social coverage. • In terms of research development DELVIC is doing a good job not only to improve the working conditions in the plants but also to make the activity more profitable. The drying time is correct with DELVIC.			

	• It should be noted that the sludge treatment plants receive more than their purification capacity, which increases the costs.			
	Bécaye Sidy Diop	DELVIC/Director	(221)77 677 56 42 Becaye.diop@delvic-si.com	13/11/2017
4	• FSTPs have returned to normal operation, despite being 6 to 7 times undersized. Heavy maintenance is carried out in terms of cleaning the sedimentation basins (we are working to reduce these operating expenses, notably with the acquisition of a cleaning truck); • Rehabilitation work on the drying beds, the truck maneuvering area, the fence wall, and a renewal of some electromechanical equipment (pumps). The profit margin would have been much higher if this work had been taken over by ONAS (which should normally have been done); • Salaries were reconsidered upwards (between +13 and + 60%); • delays in the payment of social security contributions (IPRES and CSS) have been regularized and the monthly payments of these salaries and contributions are currently paid on due date; • all staff have health insurance that covers 70% of medical expenses (consultations, tests, drugs) • the weekly working time of the staff has decreased from 52 to 48 hours; • staff receive paid leave; • staff are regularly equipped with PPE; • The operating time of FSTPs has been significantly reconsidered upwards: - before the delegation: from Monday to Friday, from 8am to 4pm and Saturday from 8 am to 2pm - After the delegation: from Monday to Saturday, from 8am to 5pm and Sunday at least one FSTP is open from 8am to 3pm. ϖ Amount of the annual license = 1,146,160 FCFA ϖ Amount of the monthly fee = 286 539 FCFA ϖ ONAS share = Delvic share = 50% of annual net profit (annual operating profit) • Operationally, the truck will drastically reduce cleaning costs in the coming years, the purchase of another trucks is on study. • On the other hand, the financial constraint in the delegation remains the expenses related to the rehabilitation, given the obsolescence of the plants. • In terms of needs, a guarantee fund with flexible access conditions would allow operators to develop their businesses. • For prospects, the introduction of innovative OP-type technologies would add more value to the business. There is the valorization of by-products that remains the future of the sector.			
	GASPAR BADJI	ADMINISTRATION AND FINANCE MANAGER PSMBV ONAS	(221) 77 547 45 49 Gaspar.badji@onas.sn	17/11/2017
5	-The guarantee fund is an excellent financing mechanism, it is a viable and replicable model, but on condition that the beneficiaries, especially the emptiers, respect their commitments. -The rate of the loan is low 7.5% compared to the rates we usually see 12 to 13%. There are unpaid and in the future to solve this problem we can change the selection criteria and make them more rigorous. We are pleased to note that out of the 38 emptiers registered in the funds, the 29 have been financed and the 9 are in the process.			
	AHMED DIALLO	Pit emptying Association	(221)77 640 93 34 elton100@hotmail.com	15/11/2017
6	The guarantee fund is a good financing mechanism that allows them to replace their trucks and equipment that were very old and obviously there are more trucks in Dakar because of the fund. The fund allows them to have access to credit at the level of conventional banks and renew their fleet, which allows to inject a lot of trucks. As a result competition comes into which allows to reduce the prices for the customers. Microfinance mutuals cover emptiers who have no guarantee. The model is viable but for its replication in the other regions of the country, a good organization is needed like the association of the emptiers of Dakar. Each emptier is entitled to one truck. To be financed, if it is an individual company here are the files to provide: - Financial Statements -repayment plan			

	-A request -A training certificate on the guarantee fund -A certificate proving that you participate in the fund's call center Corporations with capital, in addition to the above files must provide: -A cash flow plan -A full year estimated operating account. Regarding the unpaid there is not a problem, the beneficiaries will repay, they have markets with religious cities that will allow them to compensate. In the event that an emptier refuses to pay, the association can pick up the truck and give it to another. The emptying is regulated in Senegal what proves it is the code of the environment and the code of the taxes. In perspective there is the acquisition of the license of exploitation, the decree is being signed at the presidency.			
	Madieumbe Diouf	Administration and finance Director ONAS	(221) 33 859 35 09 Madieumbe.diouf@onas.sn	22/11/2017
7	ONAS does not have an operating account for Dakar but for the whole country. They have recently held a meeting with all center directors to start making operating accounts for centers among which Dakar. Madieumbe said that the work (the city study) that WWC asked us to do cannot be done in one month but two or three months. The WWC study schedule is too tight. Roughly Dakar occupies 80% of sanitation facilities in Senegal. The by-products represent about 3% and the fee represents 95% of the turnover for Dakar. In terms of data we received from ONAS the financial report for the financial year 2016 And the financial balance sheet for Dakar. Dakar has a good secure and integrated system, that is to say that sewerage systems and on site sanitation are taken into account. On how to drain more finance in the sanitation sector, Madieumbe believes that financial offers can attract more investments and get more infrastructures. This is an innovative type of financing compared to what conventional donors do. These donors give loans at concessional rates 2 to 3% over 10 to 25 years. Conventional donors have very slow procedures and often give little money. For Madieumbe using mixed financing is the right solution that is to say investing and going more towards financial offers, involving the local private sector while keeping the classic offers. For commercial offers the private invests and the State pays back little by little. There are also third parties, a private third party invests and operates for a certain time, example: Energy, the valuation of by-products globally.			
	Babacar Ndiaye	operations manager at PEPAM coordination programme	(221)775249039 b.ndiaye@pepam.sn	He travelled
8	Babacar sent us data on the evolution of rates in urban sanitation in Dakar and at the national level. (we could not meet him he travelled)			
	Dr Ababacar Mbaye	Director of Sanitation	(221)8696130 Ababacarmbaye27@gmail.com	
9	-As far as the loans repayment is concerned it is to be noticed that each donor has his own procedures for the World Bank it is the IDA procedures over a ten year period with generally an accepted delay of ten years that are applied. - The Senegalese government is more oriented to the sewerage system in urban areas even if it is extremely costy.The sewerage system represents roughly 30% and the on-site system 70%.It is about supporting the on-site sanitation which accounts for the highest rate to meet the current demand, it is then an alternative because being less costly.			
	Amadou Diallo	PEPAM National coordinator	(221)338590499 projeau@gmail.com	
10	-Concessionary loans: Repayment period of 38-40 years, with a grace period of 10 years and an interest rate of 1%;			

	-Semi-concessionary loans: Repayment period of 20 years, with a grace period of 10 years and an interest rate of 2- 4 %; -Commercial loans: Shorter repayment periods than those above and an interest rate of 6-7 %.

Annex 2: List of Collected material and use in this study

No.	Designations	Year of Publications	Sources
1	Recensement General de la Population et de l'Habitat, de l'Agriculture et de l'Elevage (RGPHAE, 2013) Rapport définitif	2013	ANSD
2	Recensement General de la Population, Rapport Régional définitif	2017	ANSD
3	Lettre de politique sectorielle de l'hydraulique et de l'assainissement en milieu urbain et rural	2017	MHA
4	Etudes d'identification de mécanismes durable de financement de l'assainissement pour le sous-secteur de l'assainissement urbain,	2017	ONAS
5	Revue Sectorielle Conjointe, PEPAM	2016	PEPAM
6	Plan d'action de mise en œuvre de la Stratégie Nationale de l'Assainissement en milieu Rural, Direction de l'assainissement.	2015	DA
7	Modele financier de ONAS en 2016	-	-
8	Plan d'investissement ONAS 2015-2025	-	-
9	Rapport de présentation des états Financiers de l'Exercice 2016 - ONAS	2016	ONAS
10	Balance Generale 31/12/2016 (XOF)–ONAS	2016	ONAS
11	Etat financier		
12	Delegation station de boues de Vidange au prive (Comptes d'exploitations des Stations de Boues de vidanges : Novembre 2013 – Octobre 2014 ; Novembre 2014- Octobre 2015	2014 and 2015	ONAS / Delvic
13	Rapport d'opportunité pour la convention de délégation de services public des station de traitement des boues de vidanges de Camberene , Niayes et Rufisque	2012	ONAS
14	Rapport Semestriel No 1, 2017 sur le Programme de Structuration du marché des boues de vidanges en faveur des populations démunies de Pikine et de Guediawaye	2017	ONAS
15	Brochure WASH Finance Project	2016	USAID / Ville de Dakar
16	Etude actualisation du Plan Directeur d'Assainissement Liquide de Dakar 2025	2013	ONAS
17	Innovations in city-wide fecal sludge management Lessons learned from Dakar, Senegal	2015	ONAS