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CHALLENGES AND ASSETS IN THE SANITATION OF CITIES IN THE REPUBLIC OF BENIN (WEST AFRICA)

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Abstract: Sanitation is one of the key sectors for achieving the Sustainable Development Goals. In Benin, many efforts are made by the government, however, challenges remain. This communication sets out the activities carried out as assets by the government in the field of sanitation and secondly what remains to be done as challenges for the achievement of the Sustainable Development Goals. Documentation made in institutions and direct observations in the field made it possible to collect data on sanitation, hygiene and water. The data collected was analyzed with the sphnix 4.5 software. The results show a synergy of institutional and non- governmental actions around sanitation. Thus, several flagship projects including, Grand-Nokoué, the Pluvial Sanitation Project of Secondary Cities (PAPVS) of Benin, the Cotonou Pluvial Sanitation Project (PAPC) have been implemented and several international agreements to increase by 100% funding each year for the sanitation sub-sector and raising the institutional positioning were signed within the framework of the Water and Sanitation for All (SWA) organization in Washington in 2012. Then, in 2015, the Declaration of N'Gor in Senegal on the occasion of the 4th African Conference on Sanitation (Africasan4 summit). The government has built new Faecal Sludge Treatment Stations in Abomey-Calavi, Sèmè-Podji and plans to build them in Parakou commune as well. The institutional profile of the sub-sector is based on feedback, bringing sanitation out of its marginality and making it a real "national cause", and the financing of sanitation projects is the real one. Sanitation is essential to improve the health of populations, is the engine of economic development and to reduce the cost of public health expenditure.

Keywords: Benin (West Africa), Sanitation, SDGs, Population health, environmental sustainability

INTRODUCTION

Like other countries, Benin is committed to the implementation of the SDGs. In this perspective, the country has decided to proceed with the prioritization of targets taking into account its aspirations, its vision, while maintaining the level of ambition carried by the SDGs and capitalizing on the experiences of the implementation of the Millennium Development Goals (MDGs). A prioritization process was conducted in 2017 by the Directorate in charge of monitoring the SDGs with all the actors involved. The prioritization aims to identify the targets and indicators of the Sustainable Development Goals (SDGs) that are in line with national development priorities given the constraints and specificities of Benin. This process allowed us to select 49 targets (with 80 indicators) out of 169, including access to drinking water and sanitation. With regard to Goal 6 (Ensure access to water supply and sanitation services for all and ensure sustainable management of water services), the national indicators selected for the specific targets taken from the RIA22 matrix on the prioritization of SDG targets are as follows:

- the rate of water supply in rural and urban areas, with the Ministry of Water and Mines as the institution responsible for implementing the target (line ministry)

- the proportion of the population using sanitation services, the coverage rate of households with excreta disposal facilities, and the coverage rate of excreta disposal facilities in schools, with the Ministry of Health as the institution responsible for implementing the target (the lead ministry).

Benin has not been able to meet the water and sanitation needs of the entire population of Benin. Disparities from one locality to another persist and half of Benin's population still does not have access to a source of drinking water. More than half of the population does not have access to improved sanitation services (SNAEP-MR 2017-2030; SNPHAB-MR 2018-2030). The challenges are significant:

With regard to the water sub-sector:

- Accelerating investments in the sector to achieve universal and sustainable access by 2021;
- Reducing disparities in access to drinking water for low-income populations, particularly in rural areas;
- access to drinking water in densely populated areas that have so far lacked access;
- Access to drinking water in quantity and quality and at affordable prices for all (with a view to eliminating inequalities);
- Efficiency in the use of mobilized resources;
- The involvement of the private sector.

With regard to the sanitation sub-sector:

- scaling up of the Hygiene and Sanitation Promotion strategies (for rural, urban and peri-urban areas) to achieve the elimination of open defecation by 2025 and universal access to improved facilities by 2030;
- Mobilization of the resources needed to achieve the above objectives;
- the involvement of the private sector.

MATERIALS AND METHODS

In this research, the methodology used is based on documentary research, institutional interviews and direct observations in the field. The institutional interviews made it possible to visit 6 institutions. The interview guide developed was sent to the resource persons met. The observation grid was used to observe and assess the government's efforts in the field of urban sanitation in Benin. The sphinx software was used to analyze the results obtained. This methodological approach led to the following results:

Institutional and regulatory framework of the sanitation sub-sector in Benin

Institutional Framework

The institutional analysis examines all the actors that play a role in the wastewater sanitation sector and those that are likely to play a role

Ministerial level: At the governmental level, several ministries are involved in the sanitation sector, the main ones being the following

The Ministry of Water (MoW) is responsible for developing and implementing government policy in the water sector.

The Ministry of Decentralization and Local Governance (MDGL):

The Ministry of Health is responsible for implementing the policies defined by the Government in the health sector. The Direction de l'Hygiène et de l'Assainissement de Base (DHAB) plays a central role in the field of sanitation.

The Ministry of the Living Environment and Sustainable Development (MCVDD) is responsible for proposing national policies in the environment and nature protection sectors and for ensuring their implementation. The General Directorate of Environment has among its missions, the control and the follow-up of all the activities of development having an impact on the environment including the fight against all the forms of pollution, the nuisances and environmental risks, in collaboration with the concerned structures.

The Ministry of Public Works and Transport (MTPT) can also intervene in sanitation, notably through its Directorate in charge of new works and its Directorate in charge of the maintenance of works.

Local authorities: The law on decentralization gives the Communes responsibility for the supply of drinking water and sanitation and important responsibilities in the area of hygiene (Articles 93, 94 and 95). However, these prerogatives are not currently fully exercised by local authorities, due to a lack of implementing legislation, financial resources and qualified human resources. SONEB is designated as the delegated project manager acting on behalf of the communes for water and wastewater services in urban and peri-urban areas.

SONEB: In January 2004, the government split the Société Béninoise d'Electricité et d'Eau (SBEE) into two separate entities. These are: Société Nationale des Eaux du Bénin (SONEB) and Société Béninoise d'Energie Electrique (SBEE). The SONEB has a capital of one (01) billion CFA francs.

The attributions of the SONEB are:

- Delegated project management, pending the assumption of this role by the Communes when the framework conditions are met;
- The collection, transfer, treatment and distribution of drinking water in urban and peri-urban areas throughout the country;
- Treatment and disposal of wastewater in urban areas.

SONEB is responsible for the treatment and disposal of urban wastewater (see the decree of creation and the articles of association), but this activity has not yet been developed by the company pending clarification of the institutional framework. SONEB is represented in the regions by six regional offices that are generally involved in water production and distribution.

The DHAB: According to decree n°2006/396 of 31/07/06 on the attribution, organization and functioning of the Minister of Health, the mission of the Directorate of Hygiene and Basic Sanitation (DHAB) is to ensure the application of the National Health Policy in terms of Hygiene and Basic Sanitation.

sanitation.

In terms of basic sanitation and hygiene, the DHAB has an important role in defining and implementing policy (Benin National Sanitation Policy PNAB) and legislation. It is also responsible for:

- the development and proper application of standards and standard plans for sanitation
- the development and proper application of standards and standard plans for basic sanitation facilities
- monitoring the development and implementation of basic sanitation programs

The DHAB is also involved in the design and implementation of basic sanitation programs and in the application of standards and regulations for the treatment and discharge of industrial wastewater.

The DHAB also participates in the design and dissemination of information in the field of hygiene.

Other missions are entrusted to the DHAB and concern (i) the control of the quality of drinking water and foodstuffs, (ii) the application of national and international sanitary regulations, (iii) the elaboration of standards and regulations on food hygiene.

The General Directorate for Water (DG-Water): The DG-Water develops and implements the national water policy. It draws up legislation and regulations relating to water management and ensures that they are properly applied. In the field of sanitation, it is responsible for:

- developing and ensuring the implementation of programs;
- defining and monitoring the implementation of the tariff policy.

Associations and NGOs in the water, sanitation and environment sectors: Several associations or non-governmental organizations are already active in the water, sanitation and environment sectors. It should be noted, however, that in the sanitation sub-sector, the associations or NGOs active in the country work mainly on solid waste pre-collection activities. This is the case, for example, of the NGO Béthesda. These structures are potential actors that can be trained to provide local services in wastewater sanitation (surveys, awareness raising, intermediation, etc.), awareness, intermediation...)

Some actors have a regional and international vocation such as: CREPA, PDM and Cities Alliance.

Special case of Water Users Associations (WUA)

Decree No. 96-317 of 2 August 1996 on the constitution, organization and operation of Water Users' Associations (WUAs) clearly states in Article 1 that WUAs are non-profit associations governed by the Law of 1901 and, in general, by the legislation in force.

According to this decree (Article 2), the purpose of the Water Users' Associations (WUA) is as follows

- to promote and improve the community drinking water supply system(s)
- To provide a public water supply service for the community;
- To operate, maintain, renew and, if necessary, expand the system(s).

Delegated Project Management Agencies: Some executing agencies are involved in delegated project management and are increasingly acting on behalf of municipalities that have project management authority as a result of the decentralization laws. Among these agencies, we can mention in a non-limitative way:

- SGDS-GN (Société de Gestion des Déchets Solides et de la Salubrité du Grand Nokoué);
- ANAEPMR (Agence Nationale d'Approvisionnement en Eau Potable en Milieu Rural);
- AGETUR (Agency for the execution of urban works);
- AGETIP-BENIN (Agency for the execution of public interest works);
- SERHAU SA (Société d'Etudes Régionales d'Habitat et d'Aménagement Urbain).

Regulatory framework

The wastewater sanitation sub-sector in Benin is currently governed directly or indirectly in its various aspects by various texts, the most important of which are

- the Public Hygiene Code promulgated in 1987 and its application decrees (1999 - 2000);
- the framework law on the environment (Law 98-030);

This agreement is to be signed jointly by three parties: the Chairman of the WUA Steering Committee, the Directorate of Hydraulics (now the General Directorate of Water), and the Sub-Prefect (now the Mayor).

- the draft law on water management;
- the decree setting the quality standards for wastewater;
- a ministerial decree (1995) on septage.

The legislative and regulatory framework is poorly enforced and often does not meet the realities and requirements of IWRM. (Integrated Water Resources Management). However, the 1987 Water Code will be replaced by the new water management law, which will take into account the context of decentralization, deconcentration, IWRM and the strengthening of stakeholders' intervention capacities.

Past and present state of urban sanitation in Benin and government efforts to provide adequate sanitation

This paper presents the past and current state of urban sanitation in Benin and the government's efforts to achieve adequate sanitation.

Past and present state of urban sanitation in Benin

Benin's cities, like other cities in the subregion, have been and are being cleaned up. In fact, urban sanitation follows a diachronic analysis and varies according to the policies in place. To this end, Plate 1 shows the level of the Womey market in a depression that constitutes a natural receptacle for the neighborhood's rainwater.



Figure 1. Status of the sanitation of the Womey market in 2015
Shot: Liner Environnement, IVATIS, BETACI, SILICON SARL, June 2015

Figure 1 presents the level of sanitation of the Womey market in 2015. The Womey market is a real factor of social mobility and development of economic activities. This market is a real center of attraction for the inhabitants of the surrounding neighborhoods who, day and night, come to buy the products necessary for their food. Unfortunately, during the rainy season, due to flooding, this market is no longer accessible to the population. Thanks to the Government Action Program (PAG), the Womey market has been cleaned up. It has benefited from the PAURAD project. Plate 2 shows a frontview of the market.



Figure 2. Womey market cleaned up in 2021
Shot: Odoulami, November 2021

The photos in Figure 2 show a view of the front of the same Womey market. It can be seen that,



10 years later, this market has benefited from the Government Action Program (PAG) and is already proving its worth in terms of improving the living environment, combating climatic hazards and protecting the environment in the nine towns that have benefited from the project to develop and rehabilitate primary, secondary and tertiary roads (asphalting). The image above presents a diachronic analysis of the environment between yesterday and today. The image above presents a diachronic analysis of the environment between yesterday and today. The comparative analysis of the present image shows that efforts are being made to clean up the cities in the Republic of Benin. These efforts find their rightful place in the various projects implemented by the government. Long before these projects, the living environment was unhealthy. Figure 3 presents a case in point.



Figure 3. Household waste in the city of Cotonou in 2017

The photos on Figure 3 show the state of street sanitation in the city of Cotonou in 2017. It appears that they were used as dumping grounds. Indeed, the edges of the streets and paved roads were used as garbage dumps. The living environment was unhealthy. In view of this situation, the government is carrying out several actions for an appropriate environment for its citizens.

GOVERNMENT EFFORTS IN THE FIELD OF URBAN SANITATION IN BENIN

Creation of the SGDS-GN

The Société de Gestion des Déchets et de la Salubrité Urbaine du Grand Nokoué (SGDS-GN SA) was created in November 2018 by the Beninese State, for the implementation of the Modernization Project for the Management of Solid Household Waste. This ambitious project, which is part of the operationalization of strategic axis 7 of Pillar 3 of the Government's Action Program, aims to sustainably resolve the problem of urban sanitation in order to improve public health conditions, the well-being of the population, and to reduce the harmful impact of the proliferation of waste on the environment.

Presentation of the SGDS-GN

The Government of Benin initiated the Solid Household Waste Management Modernization Project to address the problem of household solid waste management and sanitation in Grand Nokoué. The latter is reflected in

- A permanent increase in the amount of waste produced: more than 400,000 tons of waste to be collected and managed in a sustainable manner on a territory of approximately 1,200 km², i.e. 10% of the national territory in 2019;
- A paved and asphalted road network of more than 500 km in the Greater Nokoué area that is being extended with more than 130 km of roads being paved. The cleanliness of this road network and the maintenance of rainwater drainage structures are imperative to preserve the quality of life of the populations and to reinforce the attractiveness of the Grand Nokoué territory. This project is one of the flagship projects of the Government Action Program (PAG 2016-2021) and is part of the operationalization of strategic axis 7 of Pillar 3 of the PAG. Through this project, the Government has decided to perpetuate the colossal investments underway since 2016 and those to come, to improve the living environment of the population and to strengthen the attractiveness of the territory. This project also aims to perpetuate the achievements of the Emergency Urban Environmental Management Project (PUGEMU) and to reduce the prevalence of diseases related to unhealthy living conditions. To operationalize this project, the Government created in November 2018 the Société de Gestion des Déchets de la Salubrité du Grand Nokoué (SGDS-GN). The waste management modernization project is part of an integral and inter-communal approach to sustainable improvement of public health. The option made by the Government in creating the SGDS-GN aims at making efficient the waste management and public health services rendered to the populations by optimizing the resources. The aim is to make the cities of Greater Nokoué clean and attractive in the long term by developing innovative waste management and sanitation solutions that have a small ecological footprint and create jobs. Figure 4 presents some of the government's efforts in the sanitation sub-sector.



Figure 4. Modern means of waste collection

The photos in Figure 4 and Plate 1 show the means of waste collection in the Grand Nokoué region of Benin. The Société de gestion des déchets et de la salubrité du Grand Nokoué (SGDS-GN) has just equipped 69 small and medium-sized enterprises (SMEs) operating in the waste sector with 550 tricycles to speed up collection work in the field.



Photo 1. Modern waste collection garbage cans

To modernize waste management, households in the Greater Nokoué area (Cotonou, Abomey-Calavi, Sèmè Kpodji, Ouidah, Porto-Novo) can now package their waste in garbage cans (EN 840 standards). The required garbage cans are two-wheeled garbage bins with a capacity of 120 liters (Plate 1).

Waste sorting and recovery units for Grand Nokoué

In Benin, the Société de gestion des déchets solides et de la salubrité du grand Nokoué (SGDS-GN) plans to equip about 20 collection points with units for sorting and recycling household waste. The first unit was recently inaugurated in the city of Porto-Novo.

The Société de gestion des déchets solides et de la salubrité du grand Nokoué (SGDS-GN) is innovating for the management of household waste in the Grand Nokoué area in Benin. The public service company plans to equip its collection points with units for the sorting and recovery of recyclable household waste. About 20 garbage dumps will be equipped out of the fifty or so points in the greater Nokoué area. "Our objective is to have 70 household waste collection points. The stored garbage is collected by 69 small and medium-sized enterprises (SMEs), then transported by garbage trucks out of the cities. The photos in Figure 5 show some of the cases.



Figure 5. Foun-Foun collection point in Porto-Novo (a) and Agori in Abomey-Calavi

The photos on Figure 5 show the sorting and recovery units for recyclable household waste that are in operation at the Foun-Foun collection point in Porto-Novo (the Beninese capital) and at Agori in Abomey-Calavi. The Porto-Novo plant alone produces 60,000 tons of waste per year, of which only 30% is sent to landfills. It has a storage facility for recovered materials. About 20 garbage dumps will

be equipped out of the fifty or so points in the greater Nokoué area. "Our objective is to have 70 household waste collection points. The operation of free collection of waste in the communes of Grand Nokoué is led by the Company of management of waste and salubrity of Grand Nokoué (Sgds-GN). The photos on the board illustrate this operation.



Figure 6. Free waste collection in the communes of Cotonou and Abomey-Calavi

ADVANTAGES OF URBAN SANITATION IN THE REPUBLIC OF BENIN

Sanitation is essential to improve the health of populations

In developing countries, and particularly in urban areas, both megacities and their peripheries and in small towns, the lack of sanitation infrastructure at home and the inadequacy of wastewater treatment represent a huge threat to human health and the environment, especially for the poorest.

Conserving water resources and the living environment

On a global scale, 85% of anthropogenic pollution returns to the environment without being purified. However, the world population has multiplied by 7 over the last two centuries, and, in the last 55 years, the number of mega-cities with more than 10 million inhabitants has increased from 1 to 30, particularly in developing countries. In 2005, nearly 50% of the world's population was urban. This galloping urbanization exerts unprecedented pressures on aquatic and coastal environments that collect all the waste, while 50% of the world's population lives in coastal areas. Africa, which is expected to have 1.8 billion inhabitants in 2050, compared to 850 million today, treats only 2% of its urban, industrial and domestic pollution and is experiencing catastrophic deterioration of its aquatic and coastal resources.

In Benin, the population with access to improved sanitation facilities is 12.8% (DHS 2017-2018) and could reach 45% in 2021 and 75% in 2025. The country's ambition is to finish with air defecation by 2025 for a rate that was 42.5% (DHS 2017-2018). Indeed, at the national level, more than one household out of two (54%) does not use a toilet and still defecates in the open air (bush/fields): 77% in rural areas against 36% in urban areas. 7 out of 10 children have unhygienically disposed of feces;

- Only 13% of households use improved toilets (22% in urban areas versus 6% in rural areas). In more than half of the cases, there is no specific place for toilets and only 9% of households have toilets in the dwelling (16% in urban areas versus 3% in rural areas).

- In more than half of the cases (55%), the place used by households to wash their hands is mobile, and in only 18% of the cases does the place have soap.

It drives economic development and reduces the cost of public health spending

The costs of investing in and operating adequate sanitation systems are far less than the costs of not having sanitation. Sanitation-related illnesses are indeed a drag on economic growth. In Madagascar, it is estimated that lost work due to poor sanitation-related illnesses amounts to more than 5 million productive days per year, with a total annual value of lost production of just under 80 million Euros (representing more than 2% of the country's GNP). During the first twelve weeks of the cholera epidemic that hit Peru in 1991, the loss of revenue from tourism and agricultural exports was three times greater than the amount of investment in water and sanitation made by Peru in the 1980s (\$1 billion).

Investing in sanitation reduces the cost of public health spending

At the global level, a WHO study states that health expenditures due to the four major waterborne

diseases are estimated at more than \$7 billion per year, compared to the more than \$11 billion per year theoretically needed to halve the number of people without access to safe water and adequate sanitation.³ More than 60 percent of the investment in sanitation would be paid for by lower public health costs.

It is also an unavoidable commercial argument in the current context of international competition and the health risks of Covid-19

It is the threat of international economic sanctions and its desire to increase free trade agreements with rich countries that has pushed Chile to invest in wastewater treatment: in 2005, more than 70% of the wastewater in the city of Santiago was treated, compared to nearly 3% in 2014.

Providing sanitation promotes schooling

In Orangi, Pakistan, the construction of latrines with two spaces, one for each gender, resulted in an 11% increase in girls' enrollment.

Sanitation facilities improve social welfare

The acquisition of an excreta disposal system can often ease neighborhood relations that are often degraded by the odor nuisance caused by those who do not have a disposal system.

Sanitation is also a question of human dignity

Open defecation and unhygienic practices are often considered dishonorable and degrading. Access to adequate sanitation allows people to regain their self-esteem and that of their neighbors. Among other things, women no longer have to hide to defecate and regain their right to privacy and physical safety.

CHALLENGES OF SANITATION IN BENIN

The place of sanitation in the development agenda in Benin is mixed and faces several challenges. Indeed, the institutional profile of the sub-sector needs to be raised based on feedback, sanitation needs to be brought out of its marginality and made a real "national cause" and the challenge of financing sanitation projects needs to be addressed. The mobilization of different parties with synergy actions between sectoral ministries at the state level, but also in close collaboration with local authorities, civil society organizations, technical and financial partners. To this end, all 77 communes in Benin must integrate sanitation into their communal planning, in particular through the Communal Development Plans, and mobilize both domestic and external financial resources to finance sanitation- related actions.

CONCLUSION

In view of the assets at its disposal, sanitation is a priority of any development policy. Benin has already embarked on this by initiating several projects relating to sanitation. The largest and major is the "Grand-Nokoué" project. A project whose results can already be observed in all the municipalities concerned. However, the authorities would take up a big challenge by extending this project to all the municipalities of the country. Also, the institutional framework deserved to be reviewed in order to facilitate the financing of projects relating to sanitation.

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