

Environmental and security dynamics in school institutions: Towards a high-performing and inclusive community-based model of hygiene in southern Benin

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World Journal of Advanced Research and Reviews, 2026, 29(03), 2043-2051

Publication history: Received on 20 February 2026; revised on 28 March 2026; accepted on 30 March 2026

Article DOI: <https://doi.org/10.30574/wjarr.2026.29.3.0629>

Abstract

This article seeks to analyze the implementation of hygiene and sanitation policies, thereby contributing to the scientific literature in this field. The study employed documentary research, field surveys, observation, and interviews with 320 stakeholders from the educational perimeter of 25 public institutions. Data analysis and processing were conducted using questionnaires, interviews, the reference framework of the Beninese Environmental Agency, and ISO 14001 and 95001 standards. The investigations provided a deeper understanding of the environmental and social impacts resulting from the absence or poor functioning of hygiene and safety committees on school performance. It is urgent to implement an appropriate policy to ensure a safe, healthy, and learning-conducive educational environment.

Keywords: Hygiene; Sanitation; Governance; Secondary Schools; Inclusion; Hygiene

1. Introduction

Considered as spaces of socialization, school institutions can become environments of sanitary and security risks if appropriate measures are not taken. Statistics reveal that many schools worldwide lack basic sanitation services, affecting millions of children (Koy and Tshiunza, 2025). Safeguarding human living conditions requires attention to key indicators - hygiene and sanitation - upon which the quality of the environment depends (Gougbedji, 2025; Sissoko and Coulibaly, 2025). Problems related to water, sanitation, and hygiene can diminish children's learning capacities and exacerbate certain inequalities between girls and boys (Moucktarou et al., 2023), particularly in school settings. Environmental preservation is now at the core of numerous global environmental policies, and the lack of hygiene - both in developed and developing countries - poses a serious challenge to public health (André-Dumas and Benjamin, 2023).

Accessibility to adequate hygiene infrastructure and safe basic sanitation services is a key factor in preventing waterborne, parasitic, and infectious diseases (Mohamed, 2025; Tubi et al., 2022). Respecting the right to access safe drinking water, hygiene, and sanitation - formalized in Sustainable Development Goal 6 (SDG6) - promotes a healthy learning environment conducive to academic success. Despite this importance, the Water, Hygiene, and Sanitation (WASH) sector remains a pressing issue in secondary schools in southern Benin.

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In the departments of the Republic of Benin, research has been conducted on access to water, hygiene, and sanitation (WASH). In the Atlantique department, hygiene and sanitation levels are low in primary school institutions, thereby affecting pupils' health (Koy and Tshiunza, 2025) and increasing school dropout rates (Bachirou et al., 2019). In public colleges and high schools, poor sanitary conditions persist despite the multiplication of infrastructures (latrines, water points) financed by the State and its partners.

In Benin, as in many other countries, legislation and public policies provide for the establishment of Hygiene and Safety Committees dedicated to this purpose. These bodies are tasked with ensuring the continuous improvement of living and working conditions within educational institutions. However, the implementation of these structures encounters challenges in their adaptation to local realities. This situation highlights the difficulties in fully enforcing the related policies.

On one hand, the historically dominant community-based model relies on the informal and reactive management of parent associations. The weakness of this model lies in the tangible evidence of non-compliance, largely due to the overwhelming number of students to be managed in these institutions. On the other hand, the integrated and participatory model, embodied by hygiene and safety committees, proposes an institutionalized and inclusive approach. Despite their theoretical importance, the formal existence and effective functioning of these committees in public high schools and colleges in the Atlantique department of southern Benin remain underexplored. The observable dysfunctions raise critical questions: are they the result of a lack of political will, insufficient resources, or institutional and cultural barriers? The objective of this study is to analyze the issue of the existence and functioning of hygiene and safety committees in public secondary schools in the Atlantique department.

2. Methods

2.1. Research framework and type

The Atlantique department is located in the coastal zone of southern Benin and represents one of the country's most dynamic development poles, covering an area of approximately 3,233 km². Allada has served as the administrative capital of the Atlantique department since June 22, 2016. It is bordered to the north by the commune of Sô-Ava and Lake Nokoué, to the south by the Atlantic Ocean, to the east by the commune of Sèmè-Kpodji, and to the west by Abomey-Calavi. The department's population is experiencing sustained annual growth, with a marked predominance of youth under 18 years of age. This demographic vitality translates into significant pressure on the school system. It is estimated that approximately 150,000 students are enrolled solely in public secondary schools, meaning the department accounts for about 18% of the national school population (INSatD, 2024).

Furthermore, the contrast between the density of students per institution (sometimes exceeding 2,000 per school) and the dilapidated state of Water, Sanitation, and Hygiene (WASH) infrastructure makes Atlantique a critical area for studying health risks in school environments (INSatD, 2024). Studies reveal alarming ratios in secondary schools (CEG) in Atlantique, often exceeding 150 students per latrine, far from WHO standards (1:40 for girls and 1:50 for boys).

This is a cross-sectional study conducted in the Atlantique department, based on a triangulated methodological approach combining quantitative and qualitative analyses, complemented by a compliance audit.

2.2. Population and sampling

To capture the complexity of WASH challenges and the management of hygiene and safety committees in public secondary schools in the Atlantique department, a stratified sampling approach was adopted, targeting a total of 320 individuals. This included 240 students to assess daily practices and needs, 56 teachers and 14 administrators to evaluate the management and governance aspects of hygiene and safety committees, as well as six vendors and four local residents to understand the environmental impact on surrounding communities.

These actors were observed and interviewed not only within their institutions but also at major administrative and pedagogical gathering sites across nine (9) districts (Abomey-Calavi, Godomey, Akassato, Hèvié, Ouèdo, Togba, Kanssounkpa, Glo-djigbé, Allada). This included pedagogical zone activities and examination centers in the department (CEG 1 Allada, CEG Houègbo, CEG 2 Ouidah, CEG 1 Godomey, CEG 1 Abomey-Calavi, CEG Akassato, CEG Tori Agouako, Lycée Technique de Ouidah, Lycée Technique Asba).

2.3. Data Collection Techniques and Tools

For data collection, four investigative tools were employed in the field: a reading sheet, a questionnaire, an interview guide, and an observation grid. Quantitative data were collected via mobile phones using the Kobo Collect application. Direct observations were conducted in General Education Colleges (CEG) in the Atlantique department, focusing specifically on sanitation and hygiene infrastructures. A Techno Camon CX Air mobile phone equipped with a voice recorder was used to record interviews, with the consent of respondents.

Data collection lasted ten months, from June 2024 to April 2025, with the support of investigators trained by specialists in qualitative and quantitative data management. Certified international auditors from the Research and Studies Office for Sustainable Development (Republic of Benin) facilitated the compliance audit carried out during the survey.

2.4. Data processing

The quantitative data collected were analyzed using SPSS software, version 21.0. Composite variables were recoded and calculated, after which frequencies and percentages were computed. Results were presented in terms of counts and percentages.

Interviews, once transcribed based on the items contained in the interview guide, were processed through thematic grouping and analysis to compare the responses obtained with the research hypothesis. To achieve this, the statements collected were faithfully and fully transcribed, centering respondents' discourse around different themes previously defined by the investigators and recorded in the interview guide.

Responses that were more or less similar were classified by area of interest. After careful listening to the interview recordings, units of meaning were identified to provide content for the themes and sub-themes emerging from the interviews, in line with the study objectives. For confidentiality purposes, no information was disclosed regarding the identity of respondents; they were designated by the initials of their names.

3. Results

Among all respondents, ninety-nine were female and two hundred twenty-one were male. The sample included 240 students, 56 teachers, 14 administrators, four local residents, and six vendors.

3.1. Current Hygiene Practices and Functioning of Committees

The analysis of this plate illustrates the different categories and current state of handwashing facilities found in secondary schools and colleges in Calavi. Some handwashing devices have been abandoned since the COVID-19 pandemic, although they remain functional in other schools and colleges within the Atlantique department. This reflects a willingness among certain school actors to comply with hygiene rules. However, the majority of respondents reported that their school does not have any handwashing facilities (67%); 17% indicated the presence of manual devices, while 16% reported having sinks connected to septic tanks.



Figure 1 Handwashing facilities in schools of Abomey-Calavi [CEG Le Méridien de Cocotomey (image 1), CEG Allada (image 2), Lycée ASBA/Akassato (image 3)]

The following plate presents the types of toilets found in public secondary schools and colleges surveyed in the Atlantique department.

The analysis of the figure below shows that almost all schools have functional latrines, regardless of category. Pit latrines are the most widespread in secondary schools (CEG), followed by manual or mechanical flush toilets. Pit latrines without slabs are rare, as they are considered very archaic, and almost no schools are entirely without functional toilets. The plate below illustrates some of the types of toilets available in these institutions.

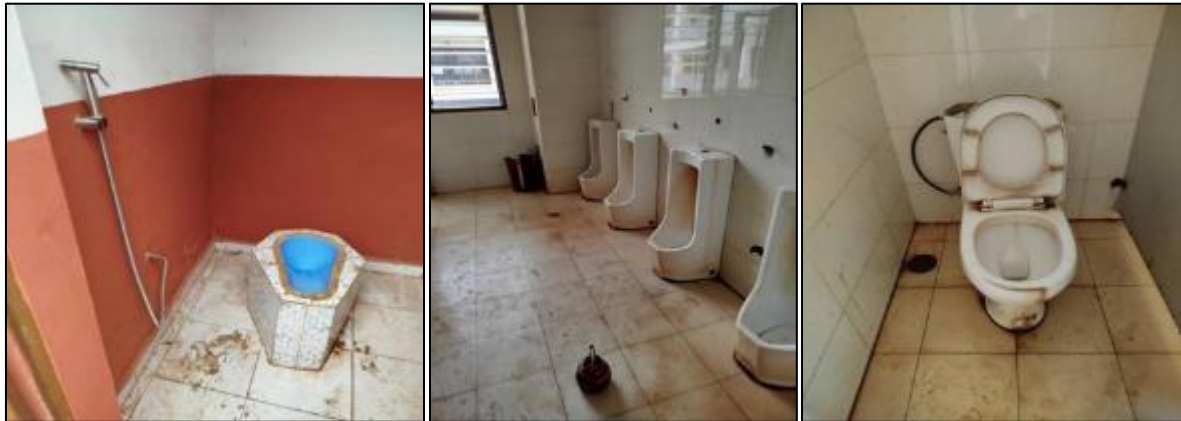


Figure 2 Categories of toilets available in Atlantique [CEG Allada (image 1), boys toilets at Lycée ASBA/Akassato (image 2), girls toilets at Lycée ASBA/Akassato (image 3)]

3.2. Existence and Effectiveness of Hygiene and Safety Committees in Secondary Schools and General Education Colleges

3.2.1. Existence of Hygiene and Safety Committees

The majority of respondents reported having no knowledge of a hygiene and safety committee within their school, while a minority affirmed the opposite. Teachers and administrators were asked whether an official memorandum had been issued establishing the existence of a hygiene and safety committee and identifying the actors responsible for hygiene and sanitation in their institutions. In this regard, a senior supervisor responded as follows:

What is the CHS? Is it different from the Consultative Council (CC), the Internal Council (CI), and the Board of Directors (CA)? Does an implementing decree already exist? (Teacher S.H.; Female, 35 years old; August 2024).

These questions reveal that even some members of the administration lack both theoretical and practical knowledge of the labor code in the Republic of Benin. A school principal responded as follows:

Someone told me that latrines were built for us in certain areas. But I do not know when this was done or in which area. Honestly, I was not aware of the existence of such a law. Is there already an implementing decree? All I know is that the management of issues related to hygiene and safety falls under the prerogatives of the school principal. Often, it is the senior supervisors (SG) who handle these matters, and sometimes also the Parent Association (APE) office through the hygiene officer. If in Atlantique we do not have a Hygiene and Safety Committee (CHS), perhaps many school principals are as poorly informed as I am. It will be necessary to raise awareness among stakeholders about the existence of these regulations. Especially regarding hygiene, I believe it is important to consider recruiting staff dedicated solely to this activity, as is often the case in private schools. (Administrative staff member P.I.; Male, 55 years old; May 2025)

This respondent's statement illustrates that many individuals lack accurate information about the committee and its importance.

3.3. Effectiveness of Hygiene and Safety Committees

Among respondents who acknowledged the presence of a hygiene committee in their school, 80.65% stated that their committee makes important decisions during meetings, which are held predominantly on a weekly basis. Respondents generally considered their committee to be effective. In this regard, a deputy senior supervisor expressed the following:

The committee meets very often, every week. We try to ensure that these sessions are held. There are also monthly and semi-annual meetings. Even with only two or three members, the meeting still takes place. (Administrative staff member K.O.; Male, 38 years old; February 2025).

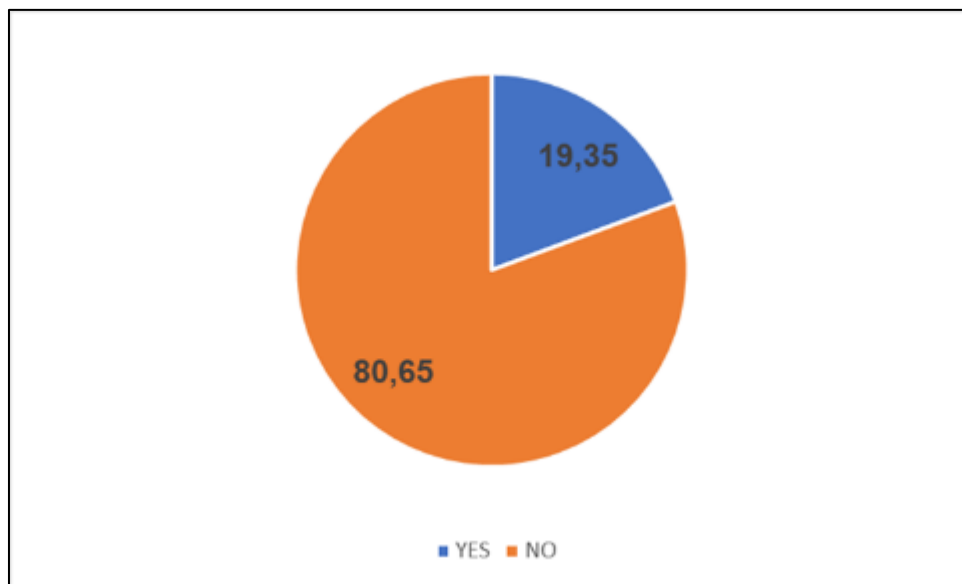


Figure 3 Effectiveness of Hygiene and Safety Committees

These remarks indicate that committees convene not only weekly but also monthly and semi-annually. This strong majority reflects recognition of the committee's role in improving sanitary conditions, raising awareness, and ensuring compliance with hygiene standards. However, the presence of nearly 20% negative opinions calls for further investigation into the causes of dissatisfaction, whether due to lack of visibility, poor communication, or limited tangible impact. This outcome highlights the need to consolidate achievements while reinforcing corrective measures to ensure even more inclusive effectiveness.

3.4. Water supply and waste management in secondary schools of Atlantique Department

This plate illustrates the unsanitary conditions under which education is delivered. A single water point serving more than two thousand students results in the area around the water source being constantly wet and mossy. Despite the availability of trash bins and waste containers, the accumulation of various types of refuse is still observed in school courtyards and behind classrooms. This situation fosters the proliferation of flies and the emission of foul odors, creating an environment conducive to the development of foodborne or respiratory diseases.



Figure 4 Water point area and waste management models in schools [water point from the borehole at CEG Agassa-Godomey (image 1), solid waste management before intervention of the waste management company (image 2), sanitation intervention by the company (image 3)]

3.5. Hygiene Management and Menstrual Waste Disposal in Secondary Schools of the Atlantique Department

Surveyed female students reported that meeting their intimate needs is difficult due to the sanitary conditions in their schools. One student confided during an interview:

It is a real ordeal for us to stay clean when we are on our period. Privacy and hygiene are a problem. (Student T.U.; adolescent, 16 years old; December 2024).

Another respondent highlighted the poor hygiene observed in the toilets. She stated:

I sometimes prefer to change in a hidden spot in the schoolyard, sometimes in the presence of my friends. The toilets are not clean. (Student A.S.; young woman, 19 years old; January 2025).

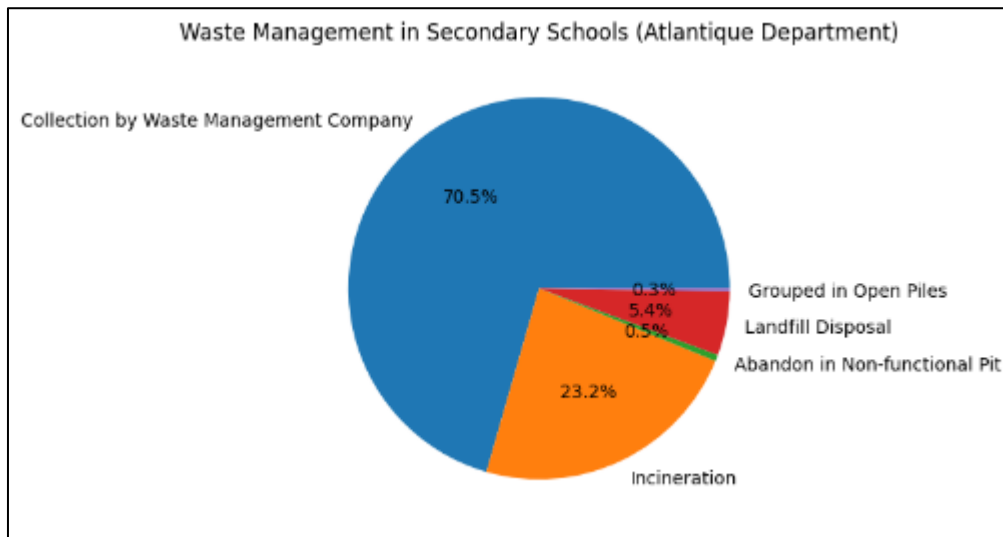


Figure 5 Waste Management in Secondary Schools of the Atlantique Department

The analysis of the figure above shows that the primary mode of waste management is through collection by a specialized waste management company. This indicates a certain improvement in waste management practices. The collection system prevents methods such as incineration and landfill disposal, thereby protecting both school users and the environment.

4. Discussion

The findings of this study highlight structural dysfunctions in the management of school hygiene within public institutions in the Atlantique department. This situation reveals a crisis in the local governance of school hygiene, situated at the intersection of community dynamics, institutional frameworks, and territorial logics.

Administrative Information Deficit and Fragility in the Institutionalization of Hygiene, Safety, and Working Conditions Committees

The results show that more than half of the administrative staff reported not having information regarding the establishment of Hygiene, Safety, and Working Conditions Committees. This reflects a deficit in the transmission of institutional information, revealing weak territorialization of school hygiene policies. The findings corroborate studies demonstrating that the effectiveness of WASH mechanisms in school settings depends on a clear appropriation of normative frameworks by local actors (Blandin-Obernesser, 2023). However, the absence of information on the founding texts of Hygiene, Safety, and Working Conditions Committees prevents their sustainable integration into the organizational structures of schools.

This situation aligns with analyses emphasizing that sanitation policies often fail less due to a lack of infrastructure than because of weaknesses in local institutional mechanisms (Akono, 2020; Leblond, 2025). In the context of Atlantique - a territory marked by rapid urbanization and increasing school demographic pressure - this lack of awareness of

regulatory frameworks contributes to the deinstitutionalization of school hygiene, leaving room for informal, fragmented, and spatially unequal practices.

From the Weakening of the Community-Based Model to the Strengthening of a Fluid, Collaborative, and Inclusive Governance Framework

The results of this study show that in all schools, the community-based approach is the one most commonly adopted, particularly by senior supervisors whose actions are limited to sweeping the schoolyard and maintaining discipline. Parents of students rarely visit the schools. In light of these findings, the management of school hygiene in the Atlantique department can be analyzed as a socio-spatial system in transition. This system reflects the failure of the community-based model, opening the way to new forms of participatory and inclusive governance (Soussi and Azougagh, 2025). However, without the effective strengthening of normative frameworks, training mechanisms, and territorially adapted financing systems, this transition risks remaining incomplete.

The majority of respondents affirmed that the hygiene committee in their school makes important decisions and is effective. These findings suggest that certain administrators are willing to move toward a more collaborative and inclusive model, which underscores the weakening of the historically dominant community-based approach founded on the involvement of parent associations and local communities. The lack of administrative information and the absence of dedicated resources undermine the capacity of communities to sustainably manage school hygiene (Maina et al., 2024). Community-based models that are not supported by strong institutional mechanisms tend to erode, particularly in urban or peri-urban contexts where local solidarities are more diffuse.

In this study, interviewed administrators reported that no budget is allocated to hygiene-related issues in their schools. They explained that the actions implemented rely on "volunteerism," reflecting the manifest goodwill of actors. This explicit call from administrators for support from authorities - both in terms of regulatory frameworks and budgetary provisions - reveals a major structural barrier in the governance of school hygiene. The absence of clearly identified budget lines for school hygiene and sanitation severely limits the ability of institutions to operationalize Hygiene, Safety, and Working Conditions Committees, even when they formally exist. Without dedicated resources, hygiene management depends on unfavorable internal trade-offs and exacerbates territorial disparities among schools. This situation contributes to an unequal geography of school hygiene, where institutions that are better located or benefit from external partnerships enjoy superior sanitary conditions.

The important decisions taken by committees in the surveyed schools that have them demonstrate recognition of their role in improving sanitary conditions, raising awareness, and establishing and enforcing hygiene standards in certain schools of the Atlantique department. This evolution marks a turning point compared to the community-based model, calling for shared responsibility among the State, ministries, local governments, schools, and educational communities.

From a territorial governance perspective, the transition toward a participatory approach would strengthen the spatial coherence of school hygiene policies (Amoussa et al., 2024; Zagre, 2025) and ensure better coordination between the education, health, and environmental sectors (Guével et al., 2025). The issue of parity within these structures - particularly by integrating students and women into decision-making bodies - emerges as a key response to challenges of equity and spatial justice in school environments

5. Conclusion

This study analyzed the issue of the existence and functioning of hygiene and safety committees in public secondary schools in the Atlantique department. It revealed the environmental and safety dynamics within school institutions, with a view to building a more effective and inclusive community-based model of school hygiene. The findings highlighted weak institutionalization of school hygiene management mechanisms, characterized by the absence or inefficiency of hygiene and safety committees in the majority of schools. The lack of administrative actors' knowledge of normative frameworks, combined with the absence of dedicated budgetary resources, reflects the exhaustion of the community-based model, which has become inadequate for the territorial realities of a department facing strong demographic pressure in schools and rapid urbanization.

Moreover, the difficulties are part of a broader regional dynamic, characterized by incomplete transitions between community governance, state institutionalization, and multisectoral approaches. When the formalization of regulatory frameworks and intersectoral integration lack the support of participatory mechanisms and territorially adapted financing, they struggle to produce sustainable and equitable effects. In this context, the emergence of a fluid model of

participatory and inclusive governance appears as an ideal solution to improve the sustainable management of school hygiene in the Atlantique department.

Such governance requires the effective institutionalization of hygiene committees, the clarification of responsibilities among educational, health, and territorial actors, and the active participation of educational communities - including students - in a framework of shared responsibility and spatial justice. This research highlights the necessity of embedding school hygiene management within a territorial and systemic perspective, consistent with Sustainable Development Goals 4 and 6. It opens avenues for further research on evaluating the fluidity of collaborative and inclusive governance models in school settings and their capacity to reduce territorial inequalities in access to a healthy, safe, and sustainable learning environment in West Africa.

Compliance with ethical standards

Acknowledgments

The authors are deeply grateful to all respondents who participated in this study.

Disclosure of conflict of interest

All the authors acknowledge that there is no conflict of interest. They all agree with what is written in this article. In accordance with the requirements of transparency and scientific integrity, we, the authors of this study, declare that we have no conflict of interest, whether financial, commercial or otherwise, that could influence the results or interpretations of our research on initiation rites in Benin, thus guaranteeing the independence and objectivity of our work and ensuring the credibility of our conclusions

Funding

This research received no financial support.

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