

The Socio-Anthropological Analysis of the National Solid Waste Management Program in Bujumbura City

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Abstract

Bujumbura city is one of the oldest cities in the Great Lakes Region. It faces challenges related to solid waste management. Despite initiatives implemented by Burundi since 1983, the qualitative research and socio-anthropological analysis show that environmental awareness and education need to be strengthened so as to achieve sustainable solid waste management.

Keywords: Solid Waste Management Program, Socio-Anthropological Analysis, Bujumbura City

Introduction

Solid waste management is still a major challenge, especially in developing countries (Kapekula *et al.*, 2007; Sujuaddin *et al.*, 2008; Longe and Ukpeber, 2009; Bundhoo, 2018; Adeleke *et al.*, 2021; Fadhullah *et al.*, 2022). In fact, some research shows that waste should be managed to achieve sustainable development (Lorrain, 2001; Bertolini and Brakez, 2008; Gracier, 2008; Zaman *et al.*, 2011; Bah *et al.*, 2021). Many countries have developed the “zero waste” policy nowadays to achieve better management of solid waste (Curran and Williams, 2012; Bogusz *et al.*, 2021; Rodríguez-Guerrero *et al.*, 2024).

The city of Bujumbura is among the African cities struggling with waste management challenges. Some obstacles to solid waste management in Bujumbura city have been identified: rapid urban growth, financial constraints, inadequate public awareness, inadequate infrastructure, and cultural attitudes (Ndabarushimana and Ndikumana, 2020; Ngabirano *et al.*, 2025).

This article, therefore, aims to examine the various policies related to solid waste management in the Municipality of Bujumbura. Here, our target is also to present recommendations for sustainable solid waste management in Bujumbura city.

Methods

General Presentation of Bujumbura City

Bujumbura, the economic capital of Burundi, is situated in the far northeast of Lake Tanganyika. It is the oldest city in the country, founded in 1897 by the Germans on a site called "Kajaga." The city is characterized by clay soils in the north and sandy soils in the south. The undeveloped areas are covered with fields, fallow land, and natural vegetation. There, you can also find activities such as fishing, industry, administrative services, and urban agriculture (Kabanyegeye *et al.*, 2021). Like the rest of Burundi, Bujumbura experiences four seasons: long and short dry seasons, along with

long and short rainy seasons (UN-HABITAT, 2012). The city is a melting pot of diverse cultures and traditions, reflecting Burundi's diversity. It also serves as a regional hub for trade and industry, with a growing economy and expanding infrastructure. The climate is tropical, with temperatures that vary depending on elevation and proximity to the lake.

Data Collection

To achieve the objectives of this study, we used both written sources and ethnographic methods. As for written sources, we used open-access search engines such as Google Scholar, Free Full PDF, and Microsoft Academic Search, which enabled us to access recent, reliable documents. We also gathered the information from organizations involved in solid waste management in Bujumbura city. We used participant observation, focus groups, and semi-structured interviews as ethnographic methods. We analyzed the results qualitatively using content analysis.

Results

Solid Waste Management Program of 1983 in Bujumbura City

Before 1972, solid waste collection in Bujumbura was unorganized. Since the population was still small and housing was spread across large plots, the waste problem had not yet become an issue. Each household handled its own waste management. Biodegradable waste was discarded in the bush or in the fields, which at the time made up most of the urban area. Non-biodegradable waste was burned along streets near homes or around fields (Citeretse, 2008).

In 1972, the Bujumbura town council established a department to collect household waste and maintain municipal buildings. A truck operated once a week (according to a well-known schedule) on the main street of each district, and residents brought their garbage for collection. However, only the main urban roads, high-rise districts, and the administrative and commercial centers received waste collection services. The collected waste was stored at a designated site: the undeveloped Buterere dump, located northwest of Bujumbura, nearly 15 km from the town center. Article 3 of decree no. 100/162 of July 12, 1983, establishing and organizing the national service, states that the purpose of the establishment is to study, implement, and operate all technical services for the Bujumbura city council, especially drainage and road works, wastewater removal, and rubbish collection (SETEMU, 1996).

The National Environment Strategy of 1993

The protection and improvement of the environment are an integral part of the National Environment Strategy as stipulated in the first paragraph

of Article 2 of Act No. 1/010 of 30 June 2000 on the Environmental Code of the Republic of Burundi. This program was developed in 1992-1993 and updated in 1997. It is a reference regulatory instrument for environmental management. It proposes "to ensure the evacuation and treatment of waste so that it does not harm health, does not cause any nuisance or pollution, to recover waste if possible and to ensure the operation of equipment, the evacuation and treatment of waste, to sort, recover and recover waste that can be recycled, to develop and manage controlled landfills in cities so that they do not harm the population and do not contaminate water (groundwater, water supply systems), regulation of waste treatment and disposal, education and awareness-raising of the population on hygiene. The strategy has defined priority actions: the organization of waste collection in Bujumbura and the development of landfills in two other secondary cities, Gitega and Ngozi (MSPLS, 2019).

The Introduction of Private Societies in 2000

Starting in the 2000s, the Government of Burundi began integrating private companies into solid waste management in Bujumbura city. Indeed, some of the associations involved in solid waste collection include CEPRODILIC WASTE MANAGEMENT, Umoja Business Company, SS Burundi, Abagwaneza Company, Green Integration for Business, Propreté Source du Développement, DIDO Company, Inyishu y'Iterambere Rirama, GICOM-Girisuku, Omega Solutions, Alpha Solutions, Runa Business Company, Zoom Company, Abayogoma Company, Bujumbura Cleaning Company, Bami Company, and Usafi Kwetu Kamenge.

In addition to removal, waste represents a significant social burden. The collection associations give taxes to the Bujumbura City Hall, which contributes to the sustainable development of the country. The more collecting societies there are, the more taxes the country collects. Also, waste collection associations have contributed significantly to reducing unemployment by offering jobs at different levels.

Collection associations typically include services such as general management, carting, collection, pickers' services, and security guards. They all operate on the assembly line. This demonstrates that solid waste collection associations have had positive socio-economic impacts on the country. However, these associations do not adhere to the formal waste management collection system (**Figure 1**).

Figure 1: Buterere National Landfill

Image taken by Emmanuel Ngabirano in February 2025

Burundi's National Sanitation Policy and Horizon 2025 Operational Strategy

In its vision, the National Sanitation Policy for a state where the evolution of hygienic practices and the use of adequate sanitation devices allow the protection of the living environment and natural resources, and the sustainable improvement of the living environment of the populations, leading to a strong economic, environmental, and health benefit due to a lack of sanitation. Its specific objective is the access of all inhabitants to a public sanitation service managed in a sustainable, efficient manner and respectful of the environment, human health, and fundamental human rights. The National Sanitation Policy sets out a clear vision that can mobilise all actors, bring coherence to hitherto limited or disparate actions, and increase the level of political priority given to sanitation. The National Sanitation Policy establishes, as principles of intervention in this area, the progressive nature of compliance with standards and the balance between coercive measures (fines) and incentives (access to certain public funding).

The Environmental Code in Burundi by 2000

In this title, we are going to develop six articles: articles 120, 121, 122, 123, 124, and 125.

Article 120

Waste must be properly treated to eliminate or reduce its harmful effects on human health, natural resources, fauna and flora, and the overall quality of the environment. Any person who produces or holds waste in

conditions likely to cause harmful effects on the soil, flora and fauna, to degrade sites or landscapes, to pollute the air or water, and in general, to harm human health and the environment, is required to ensure its disposal or to have it disposed of in accordance with the provisions of this Code and the texts adopted for its application.

Article 121

When waste is abandoned, deposited, or treated in contravention of the provisions of this Code and the regulations in force, the administration concerned shall automatically dispose of the said waste at the expense of the offenders or those civilly liable.

Article 122

Every producer of industrial waste must take all possible measures to ensure or improve the environmentally sound management of industrial waste, to apply new low-waste technologies, and to ensure the separate storage and disposal of such waste. This waste must be disposed of, depending on its nature, in sites or installations approved by the Environment Agency.

Article 123

A decree issued on the basis of a report from the Minister for the Environment will set the standards for classifying waste and set the conditions for its management. These conditions concern the treatment, handling, collection, sorting, storage, transport, and disposal of waste across various categories, including household waste.

Article 124

No person may operate a waste treatment or disposal site or facility or generate hazardous waste unless he or she has a permit issued by the Environment Authority. Waste treatment sites or facilities fall under the first class of classified facilities as defined by Articles 107 and 109 of this Code. As such, they are subject to the impact assessment procedure.

Article 125

No one may import hazardous wastes into the territory of the Republic of Burundi or use the territory of the Republic of Burundi for transit purposes for the transport of hazardous wastes.

It is prohibited to export hazardous wastes to any country without the prior written permission of the Environment Agency and the prior approval of the relevant authorities of the recipient country.

Waste water, waste oil, and other liquid waste from industrial, commercial, artisanal, agricultural, or livestock installations must be treated physically, biologically, or chemically before being disposed of in accordance with the implementing texts of this Code. The texts set the deadline within which installations and establishments existing on the date of promulgation of this Code must comply with the obligations established. However, these obligations are not respected because the people are not well informed about environmental protection and preservation (**Figure 2**).



Image taken by Emmanuel Ngabirano in January 2025 at Kamenge area

The Clean and Waste-Free Bujumbura Project of 2013

In 2013, this project was born in Bujumbura with the aim of ensuring effective waste management. Among other things, it involved developing a waste-disposal area, implementing a management system, and designing infrastructure for the collection, transport, and landfilling of waste. The cost of the work was 11.8 million Euros. In this movement, the three transfer stations were planned. They would be located in the sites of Buterere, Mpimba, and Nyabaranda. This project also aimed to establish a new controlled landfill with sufficient capacity to serve Bujumbura city as a garbage dump for at least 10 years.

The New Principle of Burundi: Case of OBUHA Service since 2019

To ensure better waste management, there has been a new principle recently put in place by the Burundian Office of Urban Planning, Housing and Construction (OBUHA) in order to limit the impacts of solid waste on the environment in general, and this principle is the "3R-V-E Principle":

Reduction (R) at source: use products that generate little waste.

Reuse (R) : Reuse those that are reusable.

Recycling (R) : Recycle those that are recyclable.

Valorization (V) : Valorization of those that can be recovered.

Elimination (E): Eliminate those obtained at the end of all necessary treatments.

To ensure good solid waste management practice, OBUHA has defined new guidelines: Waste conditioning in the production medium, the semi-collection of solid waste, which can be the door-to-door collection by associations committed to this work or this collection can be done individually, the sorting of this waste deposited in transit sites: to separate the waste that is recovered; those that are recyclable, those that can be reused. After sorting, the waste is transported to the waste treatment site, where waste not used in other activities is buried in a landfill.

The 100 Days of Sanitation Movement and the Zero Waste Movement of 2020

Both movements were launched by the government of Burundi in the 2020s to make cities cleaner and protect the environment. These initiatives aim to keep Bujumbura city clean, such as installing public garbage cans, establishing a recycling factory, and removing recovered bottles from the market.

The "Zero Waste" Movement for Cleaner and Sustainable Cities by 2024

On March 19, 2024, Burundi launched the "zero waste" movement during the ceremonies held in Bujumbura City Hall. This movement aims to address pollution in public spaces, workplaces, and homes. The goal is to have a clean, holy, and sustainable environment for all Burundians. For this movement, Burundi is thus joining the global dynamic aimed at reducing pollution levels and preserving the environment by actively contributing to achieving the Sustainable Development Goals.

This movement is part of the initiatives already taken by Burundi to promote cleanliness and environmental protection, in particular, the 2013 national sanitation policy and the 100 years of sanitation. The main axes of this movement include public awareness, the organization of waste collection, and capacity building for the actors involved.

Various banking bodies expressed their gratitude for this Government of Burundi development initiative. They promised to support these commendable initiatives aimed at making metropolitan spaces cleaner. Private companies and civil society organizations have also expressed their support and willingness to join the "zero waste" movement. In this agenda, Burundi encouraged all Burundians to actively engage in solving the pollution problem. He stressed the importance of collecting waste and transforming it, thus informing the population of the basics of the circular economy. He noted that every individual has a role to play, whether through

adopting waste-reduction practices, recycling, or participating in community clean-up initiatives. The zero-waste movement represents an important step in the country's efforts to fight pollution and preserve the environment (Figure 3).



Image taken by Emmanuel Ngabirano in September 2025 at Ngagara area

Discussion

From 1980 to the present, we can see that solid waste remains a challenge in Bujumbura city. According to the results, solid waste is piled up here and there across the city of Bujumbura. Social perceptions must be considered because they influence the solid waste management so much (Jones *et al.*, 2010, Kokkinos *et al.*, 2019, Srangsrivong *et al.*, 2019). Awareness and environmental education are still needed to achieve the best management of solid waste (Hasan, 2004; Desa *et al.*, 2011; Licy *et al.*, 2013; Debrah *et al.*, 2021; Bachiri, H., & El Kadiri, 2024). In other words, the people need to understand that waste contributes more to the circular economy (Ezeudu, 2019; Tisserant *et al.*, 2019; Mandpe *et al.*, 2023; Awino and Aptiz, 2024).

Conclusions

Despite the Government of Burundi's initiatives, Bujumbura city still faces numerous challenges in solid waste management. Therefore, to achieve sustainable solid waste management, a multi-sectoral approach must be adopted:

- Enhance public awareness (conduct awareness campaigns to educate residents on proper waste disposal practices).

- Improve waste collection infrastructure (increase the number of waste collection bins and ensure regular emptying).
- Implement waste sorting (introduce waste sorting at source to separate recyclables, organics, and non-organics).
- Develop a sanitary landfill (construct a properly designed sanitary landfill to replace the existing dumpsite).
- Increase funding (allocate sufficient funds for waste management infrastructure and services).
- Monitor and evaluate (establish a monitoring and evaluation system to track progress and identify areas for improvement).

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References:

1. Adeleke, O., Akinlabi, S., Jen, T.C. and Dunmade, I. (2021). Towards sustainability in municipal solid waste management in South Africa: survey of challenges and prospects. *Transactions of the Royal Society of South Africa*, 76 (1), 53-66.
2. Awino, F.B. and Apitz, S.E. (2024). Solid waste management in the context of the waste hierarchy and circular economy frameworks: An international critical review. *Integrated Environmental Assessment and Management*, 20 (1), 9-35.
3. Bachiri, H., & El Kadiri, K. E. N. Z. A. (2024). Transformation towards Sustainable Urbanism: Hay Riad Urban Center at the Forefront of Waste Management. *International Journal of Economic Studies and Management (IJESM)*, 4(2), 326-336.
4. Bertolini, G., & Braquez, M. (2008). Waste Management, Innovations and Territories: Experiential Reviews and Contextual Research. *Markets and Organization*, (2), 92-113.
5. Bogusz, M., Matysik-Pejas, R., Krasnodębski, A. and Dziekńsk, P. (2021). The concept of zero waste in the context of supporting environmental protection by consumers. *Energies*, 14 (18), 5964.
6. Bundhoo, Z.M. (2018). Solid waste management in least developed countries: current status and challenges faced. *Journal of Material Cycles and Waste Management*, 20 (3), 1867-1877.
7. Burundi. (2000). Law No. 1/010 on the Environmental Code of the Republic of Burundi of 30 June 2000.

8. Citeretse, L., & Walter, H. E. C. Q. (2008). Household solid waste in Bujumbura city (Burundi): What prospects for sustainable management. Master in Environmental Sciences and Management, IGEAT, Free University of Brussels.
9. Curran, T. and Williams, I.D. (2012). A zero waste vision for industrial networks in Europe. *Journal of Hazardous Materials*, 27, 3-7.
10. Debrah, J.K., Vidal, D.G. and Dinis, M.A.P. (2021). Raising awareness on solid waste management through formal education for sustainability: A developing countries evidence review. *Recycling*, 6 (1).
11. Desa, A., Abd Kadir, N.B. and YusooF, F. (2011). A study on the Knowledge, attitudes, awareness status and behaviour concerning solid waste management. *Procedia-Social and Behavioral Sciences*, 18, 643-648.
12. Ezeudu, O.B. and Ezeudu, T.S. (2019). Implementation of circular economy principles in industrial solid waste management: Case studies from a developing economy (Nigeria). *Recycling*, 4 (4), 42.
13. Fadhullah, W., Imran, N.I.N., Ismail., S.N.S. *et al.* (2022). Household solid waste management practices and perceptions among residents in the East Coast of Malaysia. *BMC Public Health*, 22 (1), <https://doi.org/10.1186/s12889-021-12274-7>
14. Garcier, R. J. (2014). Disperse, confine or recycle? Law, management modes and spatial circulations of low radioactive waste in France. *Space Geographic*, 43(3), 265-283.
15. Hasan, S.(2004). Public awareness is key to successful waste management. *Journal of Environmental Science and Health*, 39 (2), 483-492.
16. Jones, N., Evangelinos, K., Halvadakis, C.P., Iosifides, T. and Sopholous, C.M. (2010). Social factors influencing perceptions and willingness to pay for a market-based policy aiming on solid waste management. *Resources, Conservation and Recycling*, 54 (9), 533-540.
17. Kabanyegeye, H., Useni Sikuzani, Y., Sambieni, K.R., Masharabu, T., Havyarimana, F. and Bogaert, J. (2021). Thirty-three years of spatial dynamics of land use in the city of Bujumbura, Republic of Burundi, *Afrique Science*, 18 (1), 203-215.
18. Kapekula, K.M., Colson, G., Sabri, K. and Thonart, P. (2007). A multiple criteria analysis for household solid waste management in the urban community of Dakar. *Waste Management* , 27 (11), 1690-1705.

19. Kokkinos, K., Karayannis, V., Lakioti, E. and Moustakas, K. (2019). Exploring social determinants of municipal solid waste management: survey processing with fuzzy logic and self-organized maps. *Environmental Science and Pollution Research*, 26 (35), 35288-35304.
20. Licy, C.D., Vivek, R., Saritha, K., Anies, T.K. and Josephina, C.T. (2013). Awareness, attitude and practice of school students towards household waste management. *Journal of Environmental*, 2(6), 147-150.
21. Long, O.O. and Ukpeber, E.F. (2009). People's perception on household solid waste management in Ojo Local Government Area in Nigeria. *Iranian Journal of Environmental Health Science and Engineering (IJEHSE)*, 6 (3), 201-208.
22. Lorrain, D. (2001). The Waste Sector in the United States (I). *Flow*, 1(48), 73-83.
23. Mandpe, A., Paliya, S., Gedam, V.V., Patel, S. and Tyagi, L. (2023). Circular economy approach for sustainable solid waste management: A developing economy perspective. *Waste Management and Research*, 41 (3), 499-511.
24. MSPLS. (2019). Medical and fecal waste management plan of the NKURIZA Project, Bujumbura. MSPLS.
25. Ndabarushimana, A., and Ndikumana, C. (2020). Fight Against Unhealthiness within the Local Communities of the City Hall of Bujumbura: Analysis of the Role of the Cooperative "Isuku Iwacu" of the Kinama Zone, *European Scientific Journal, ESJ*, 16(32), 6. <https://doi.org/10.19044/esj.2020.v16n32p78>
26. Ngabirano, E., Nke Ndi, J., Bigumandondera, P., Manirambona, J.B. & Nsengiyumva, V. (2025). The Bujumbura city facing the challenges of household solid waste management: contribution to the anthropology of development. *Open Journal of Social Sciences*, 13(7), 728-738.
27. PNA. (2013). Burundi-Burundi National Sanitation Policy and Operational Strategy Horizon 2025. Ministry of Water, Environment, Spatial Planning and Urban Development.
28. Rodríguez-Guerreiro, M.J., Torrijos, V. and Soto, M. (2024). A Review of Waste Management in Higher Education Institutions: The Road to Zero Waste and Sustainability. *Environments*, 11 (12), 293.
29. SETEMU. (1996). Study of solid waste and sludge disposal of Bujumbura city. Bujumbura : Régie des Services Techniques Municipaux (SETEMU), Bujumbura.

30. Sujuaddin, M., Huda, S.M.S. and Hoque, R. (2008). Household solid waste characteristics and management in Chittagong (Bangladesh). *Waste Management*, 28 (9), 1688-1695.
31. Srangsiwong, A., Olapiriyakul, S. and Yenradee, P. (2019). Factors influencing public and impact distance of a municipal solid waste dumpsite in Thailand. *Asia-Pacific Journal of Science and Technology*, 24 (1), 1-13.
32. Tisserant, A., Pauliuk, S., Merciai, S., Schmidt, J. and Richard, J.F. (2017). Solid waste and circular economy : a global analysis of waste treatment and waste footprints. *Journal of Industrial Ecology*, 21 (3), 628-640.
33. UN-HABITAT. (2012). Burundi: Urban Profile of Bujumbura, United Nations Human Settlements Programme, Nairobi.
34. Zaman, A.U and Lehmann, S. (2011). Challenges and opportunities in transforming a city into a “zero waste”. *Challenges*, 2(4), 73-93.