INTERNATIONAL JOURNAL OF SOCIAL SCIENCES AND HUMANITY DEVELOPMENT (IJSSHD)

eISSN: 3087-4076

Volume. 03, Issue. 06, pp. 17-24, June 2026"

Man, and His Environmental Challenges: A Case Study of Waste Management in Uyo and its Environs 2018-2022

Ubongabasi Ebenezer Israel
Department of history and international studies, University of Uyo, Nigeria

Article received: 21/04/2026, Article Accepted: 23/05/2026, Article Published: 18/06/2026
DOI: - https://doi.org/10.55640/ijsshd-v03i06-04

© 2026 Authors retain the copyright of their manuscripts, and all Open Access articles are disseminated under the terms of the Creative Commons Attribution License 4.0 (CC-BY), which licenses unrestricted use, distribution, and reproduction in any medium, provided that the original work is appropriately cited.

ABSTRACT

Man's relationship with the environment has often been characterized by exploitation, negligence, and a troubling disregard for the ecological consequences of his actions. This paper analyzes the relationship between the anthropogenic factor and environmental decline using the particular case of waste management in Uyo and its surroundings from 2018 to 2022. This period summarizes a paradox as Akwa Ibom State took the award of the cleanest state in Nigeria for five years in a row whilst the mountain of waste management failure continued to rise throughout the state. The study uses an analytical historical methodology and utilizes documentary materials, journal articles, and fieldwork to reconstruct the history of the waste management crisis that took place during the period. Findings indicate a multifaceted history of institutional failure, infrastructural dereliction and the distressing incongruity between the environmental awards and the actual situation on ground. The year 2022 became the worst crisis period as the odour of the Uyo Village Road dumpsite, which was set up in 2013, after the Udo Street dumpsite was closed down due to it's reported menace, started to permeate into the Governor's Office Annex, State Judiciary headquarters, the Traditional Rulers Council Hall and even the Primary Healthcare Centre handling more than 500 babies and expectant mothers every day. The paper also confirms that the failure in managing waste did not exist in isolation but it overlapped with other environmental risks since poor disposal of the refuse posed a threat to the N13.6 billion pipe jacking drainage system which was put in place in 2011, thus fueling urban flooding. By 2023, the measures of the municipal waste within the state had surpassed 15,000 tons per day with the most critical areas recorded in Nwaniba Road, Ikpa Road, Itam Market, and Abak Roads. The paper concludes that the challenges posed by man to the environment in Uyo was not only exhibited in the piling of garbage but also the systemic failure of translating the institutional structures and national pride into an ecological cost-effective fusion on environmental practice with far-reaching consequences to the health and aesthetics of urban setting and the environment.

KEYWORDS

Anthropogenic, Exploitation, Multifaceted, Infrastructural dereliction, Environment.

INTRODUCTION

When Akwa Ibom State was carved out of Cross River State on September 23, 1987, by the military administration of General Ibrahim Babangida, Uyo inherited the status of state capital almost overnight, transitioning from a modest local government headquarters into an administrative centre that bore the full weight of new government's ambitions. That transformation set in motion a demographic expansion that the state's successive administrations would spend decades struggling to contain its environmental consequences. From the earliest military governors, starting from Tunde Ogbeha (1987–1988), Godwin Abbe (1988–1990), and Idongesit Nkanga (1990–1992), through the civilian interregnum of Akpan Isemin and the uninterrupted democratic era beginning in 1999, the management of solid waste in Uyo remained one of the most persistently neglected aspects of urban governance. The problem was both structural and statistical.

A study by E. N. Okey, E. J. Umana, A. A. Markson, and P. A. Okey on waste generation in Uyo recorded a per

capita output of between 0.49 and 0.60 kg per day, with a waste stream composed of roughly 65 percent compostable materials, 10 percent plastics, and 8 percent paper. These figures, though already troubling, would pale against later measurements. By the early 2020s, per capita generation had climbed to 1.34 kg per day across the Uyo Capital City Development Area, with ten-year projections pointing to a further increase of approximately 40 percent. The institutional response to this development remained inconsistent until Governor Udom Emmanuel reconstituted the Akwa Ibom State Environmental Protection and Waste Management Agency (AKSEPWMA) on September 5, 2018, appointing Obong Prince Ikim as Board Chairman and charting what the agency described as a new road map for environmental governance. Yet, even as AKSEPWMA's interventions earned Akwa Ibom the designation of Nigeria's cleanest state for five consecutive years, the daily volume of municipal and household waste generated across the state reached a staggering 18,000 tons, damaging landfill infrastructure and threatening public health. It is against this backdrop that this study will examine the management of waste materials in the city of Uyo from 2018 to 2022, tracing how waste management in Uyo has turned into a crisis of governance, public health, and environmental credibility.

Waste and Waste Management: A Conceptual Analysis

Any serious engagement with the problem of waste in Uyo must begin with a clear understanding of what waste actually is and what its management entails. Under the Basel Convention of 1989, the foundational international legal instrument on the subject, waste is defined as "substances or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law." This definition does not specify the form, origin, or composition of waste materials. A heap of rotting food outside Itam Market, or dirty water running from a neighbourhood in Urua Ekpa into a blocked drainage channel are all considered as wastes provided someone has decided, or is compelled, to get rid of them.

The United Nations Statistics Division offers a complementary but subtly different perspective, describing waste as "materials that are not prime products for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose." This definition shifts the weight from legal obligation to economic utility. Waste here is not merely what the law says must be discarded, but what the producer can no longer find a use for, and that distinction has practical consequences.

Cecilia Nwufo, in an attempt to understand what waste means in the Nigerian urban context defines waste as that which is "unproductive, empty, rejected and superfluous," adding that materials cross the threshold into waste the moment their owner is willing either to give them away or to pay for their removal. She views waste as the relationship between that substance and the person who holds it, an act of social rejection more than a material condition. What is waste to one person, Nwufo's affirms, may not be waste to another, and that ambiguity has particular resonance in Nigerian cities where informal scavengers routinely recover metals, plastics, and paper from open dumpsites and convert them into income. Sylveer and Ikudayisi take a different approach, describing waste as "material originating from animal and human activities, and when discarded as useless and unwanted, it attracts pathogens." Where Nwufo is concerned with the social verdict passed on a material, Sylveer and Ikudayisi are concerned with its biological consequences.

It is from this understanding of waste that the question of its management properly arises as Ogu and Oyebode understood waste management as encompassing "all the activities and actions required to manage waste from inception to its final disposal," a chain that includes generation, collection, storage, transportation, treatment, and disposal. Their idea conceives waste management not as a single act but as an unbroken sequence. The failure of any one link collapses the whole. In Uyo, almost every link in that management chain was weak, and several had effectively broken down before the study period even began.

T. C. Ogwueleka, whose survey of municipal solid waste management across the country remains one of the most cited in the field, found that regardless of local conditions, most Nigerian cities defaulted to open dumping or uncontrolled landfills as their primary disposal route. He traced this tendency not to ignorance but to structure. In most states, environmental agencies are headed by political appointees with little or no technical training, producing management systems that were, in his words, "usually haphazard." J. C. Agunwamba, examining the same problem from a policy angle, was more direct. He identified a fundamental gap at the heart of Nigeria's waste governance where governments urged the public to participate in clean-up exercises while simultaneously failing to provide the disposal infrastructure that would make such participation meaningful. Read together, Ogwueleka and Agunwamba describe two sides of the same failure: a system that is technically incompetent and politically indifferent and Uyo under the study period was a near-perfect illustration of both.

In Uyo, the Uyo Village Road landfill serves as the city's sole disposal facility by the period under study. It receives waste from three broad categories of generator which includes residential, commercial, and industrial sources. Households across the Uyo Capital City

Development Area contributed a per capita output of between 0.49 and 0.60 kilograms per day in earlier years, with the bulk of this stream made up of food remnants, vegetable matter from household cooking, and the growing fraction of plastic packaging that accompanied increasing commercialization. Commercial sources which are principally the city's major markets produce a disproportionate share of organic waste. Itam Market is particularly notorious for the volume of perishable refuse its daily transactions leaves behind, with traders paying sanitation levies that rarely translated into actual refuse collection. The small and medium-scale industrial premises that are scattered across Uyo's newer residential corridors like Nwaniba, Oron Road and Ikot Ekpene Road contribute metals, chemicals, and manufacturing offcuts, a waste stream that earlier characterization studies found accounted for an increasingly significant, though poorly tracked, fraction of the city's total output.

Causes of Waste Management Crisis in Uyo

Urban Expansion without Environmental Planning

When Akwa Ibom State was created in 1987, Uyo was a local government headquarters. It was a mid-sized provincial town ringed by farmlands and forests. Within two decades, it had become one of the fastest-growing cities in the Niger Delta, pulled along by oil revenues, federal allocations, and the administrative machinery of a new state government. That growth came at a measurable ecological price. A remote sensing study tracking land use change in Uyo between 1985 and 2018 found an increase in built-up structures accompanied by a consistent decline in vegetation cover, with the Normalized Difference Vegetation Index confirming year-on-year losses as forests gave way to roads, markets, and residential estates. The city's projected population of approximately 1.4 million by the early 2020s shows an average annual growth rate of 3.4 percent, but the infrastructure built to manage the waste that population generated had not kept pace.

This challenge is not a problem that only Uyo faces. Across Nigeria, most urban centres like Lagos, Abuja, Port-Harcourt absorb migrants faster than their infrastructure can carry. The country's urban growth rate consistently exceeds 5 percent annually and is driven by what demographers described as powerful pull factors which include; employment, education, and perceived economic opportunity without commensurate investment in sanitation or solid waste systems. In Uyo's case, the state government poured its oil-derived resources into roads, stadiums, and government complexes while the question of where daily refuse would go remained largely unresolved. By 2013, a Federal Ministry of Environment survey had recorded approximately 30,327 tonnes of solid waste generated in Uyo in a single year. This figure is already an alarming volume that the city's landfill on Uyo Village Road is in no position to absorb sustainably.

Structural Weaknesses of Waste Management Institutions

The institutional body responsible for managing Uyo's waste was, from the outset, built on weak foundations. Studies have consistently identified failures that ranged from inadequate financing, absence of any home-to-home collection system, insufficient data on waste volumes, shortage of equipment and trained personnel, and a regulatory environment too fragmented to enforce its own rules. Cyril Effiong's study on the determinants of solid waste management in Uyo metropolis identified six factors whose presence or absence largely determined the system's effectiveness. These factors are adequate policy framework, public education, strong institutional structure, proper management, transparency, and adequate staffing. The study further reveals that as at 2022 virtually none of these was functioning at an acceptable level.

The agency tasked with managing this situation, the Akwa Ibom State Environmental Protection and Waste Management Agency (AKSEPWMA), operates with chronic under-resourcing through much of the period before 2018 as acknowledged by a AKSEPWMA worker at Ikpa Road Traffic Light. Rather than deploying door-to-door collection, the agency's model depended on open bins placed at certain places within the city where residents were expected to walk to. These bins were then emptied, howbeit, inconsistently into compactor trucks that are bound for the Uyo Village Road landfill. This facility has been classified by researchers as "low class, semi-controlled," meaning staff were present on site but proper control systems and engineering safeguards were absent. When Governor Udom Emmanuel reconstituted the agency in September 2018 under a new board chairman, Prince Ikim, it was in part an acknowledgment that the structure was not efficient and needed resurrecting. The agency itself admitted that by that period, over 18,000 tonnes of municipal and household waste was being generated daily across Akwa Ibom State, with no credible plan to process or recycle any of it.

Behavioral Factors

The Institutions established to manage waste alone do not explain the scale of waste crisis in Uyo. The behavior of Uyo's residents is another factor that contributes to the problem. Fieldwork conducted across the city where public bins were located found that the most common waste disposal practices was usually done in a "drive-and-throw" manner whereby residents tossed refuse from moving tricycles and cars. Most residents preferred open burning, and indiscriminate roadside dumping, while only a minority of households make regular use of the open bins provided by government. Majority of Uyo residents that engage in open dumping and burning of

household waste are unaware of or indifferent to the environmental implications of their actions.

The consequences of this behavioral pattern were already visible before 2018 as the old Udo Street dumpsite that is located along Wellington Bassey Street behind the University of Uyo, had operated for years with a single caterpillar pushing refuse into a valley, until health-related concerns associated with the site made its continued use untenable. In its place, the Uyo Village Road site was established in 2013, not as a planned, engineered alternative, but as an emergency substitute. Siting a dumpsite in a Government Reserved Area and close to important state institutions was a decision that was born out of desperation, not design, and it planted the seed of the more acute crisis that would unfold later. Residents, meanwhile, responded to the closure of the Udo Street site not by changing their disposal habits but by finding newer, closer informal dumping grounds. This pattern unintentionally turned virtually every busy road corridor in Uyo into an unofficial refuse point including places like Ikpa Road by Traffic Light, Ewet Housing Estate close to the Estate Police Station, Gitto Junction by Oron Road, Nelson Junction by Calabar-Itu Highway, Aka Idak Eyop Junction along Aka Etinan Road, Uyo Township Stadium, Ekpiri Nsukara and Use Offot Market along Nwaniba Road etc.

Waste Management Crisis in Uyo and Its Environs: The Award Years and the Hidden Reality

On September 5, 2018, Governor Udom Emmanuel reconstituted AKSEPWMA and handed Prince Akpan Ikim a mandate to reposition the state's environmental regulation. What followed was, by several institutional measures, a genuine record of performance. Vegetation control, which had languished at 28 percent coverage before Ikim's assumption of office, climbed to 68 percent within two years and reached 78 percent by 2021. Prosecution of environmental defaulters exceeded 1,427 cases, street trading enforcement intensified, and the agency's own performance index which was measured by an independent assessment firm, Telsrad Projects, recorded an 85 percent improvement over preceding administrations. By December 2018, Clean-up Nigeria (CUN), a frontline international NGO with consultative status at the United Nations, had named Akwa Ibom the cleanest state in the country. This was a distinction the state retained without interruption through 2019 and 2020, and eventually for five consecutive years through 2022, accumulating a 64 percent score in the comprehensive 2021 national environment study that covered over 2,752 pages of data.

Notwithstanding, the awards told only half the story and arguably the more convenient half. Even as trophies arrived at Government House, Uyo, the daily urban and household waste volume across Akwa Ibom State had reached 18,000 tonnes, and the sole designated landfill at Uyo Village Road was receiving that load without any recycling infrastructure, composting facility, or engineered containment system in place. The agency's own chairman acknowledged before the state assembly in late 2020 that AKSEPWMA was still battling serious shortages of equipment as it had no swing-arm trucks, no roll-up trucks, no backhoes or bulldozers, and that despite the state's much-publicized environmental credentials, the legal instrument governing the agency's operations had still not received executive assent. What the CUN award used as a parameter for measuring the level of cleanliness in the state was just the visible surface cleanliness such as swept roadsides, cut grass, prosecuted roadside vendors and not the deeper mechanics of waste generation, treatment, and safe disposal.

The COVID-19 pandemic of 2020 exposed this gap with ease as Macaulay Akpan's study examined AKSEPWMA's performance during the second quarter of 2020 and found that supervision, political will, and consistent sanctioning were the factors that determined waste disposal compliance the most. However, these factors had been severely disrupted by the COVID-19 lockdown restrictions and the diversion of state resources toward pandemic response. AKSEPWMA's planned partnerships with private companies like Association of Waste Handlers in Akwa Ibom (AWHAK) and EDEN (Environmental Development and Nature) to convert waste into fertilizer and recyclable materials which the agency had flagged as a critical revenue and sustainability strategy eventually collapsed as the potential investors withdrew. Out of N520 million earmarked for the agency in the 2020 fiscal year, only N3.8 million had been generated by October of that year, limiting enforcement capacity at the worst possible time. The pandemic did not create the fragility in Uyo's waste governance, but it stripped away the surface activity that had masked it.

The Dumpsite Crisis and Infrastructural Deterioration

By 2021, the Uyo Village Road dumpsite had become the most visible symbol of the gap between the state's reputation as the cleanest state in Nigeria and its environmental reality. The site which was originally positioned in a Government Reserved Area and described by officials as remote from residential zones, had long since been overtaken by the city's rapid expansion. The waste volume that arrived daily overwhelmed the site's capacity, and refuse began spilling onto the road itself, blocking traffic and generating complaints from an increasingly irritated public. More troubling was the site's proximity to the state's Governor's Office Annex, the State Judiciary headquarters, the Traditional Rulers Council, Hall and a Primary Healthcare facility that attended to more than 500 mothers and infants every day. In August 2023, a motion on the floor of the Akwa Ibom State House of Assembly described the situation in

unambiguous terms, with lawmaker Hon. Uwem Imo-Ita stating that:

“the proximity of the dumpsite location is critically disturbing Government facilities, including the Government House, State Judiciary headquarters, Uyo Local Government Council, and Nigerian Police ‘B’ Division, amongst other facilities making it hazardous and injurious to the health and wellbeing of inhabitants within these environs.”

Waste management crisis within the city was further intensified by the severe flooding that followed in the same year. The N13.6 billion underground pipe jacking drainage that was commissioned in 2011 by then-President Goodluck Jonathan and described at its launch as the first of its kind on the African continent had been designed to resolve the chronic flooding of the Idoro-Itam-Ikot Ekpene Road axis of Uyo. Before its construction, floods had regularly submerged homes and businesses along that corridor. But by 2021, Iniabasi Umo, a reporter with the Daily Trust reported the progressive blockage of the drainage's feeder channels with sand and solid waste, with weeds overtaking the outfall section at Ikot Ekang in Itu Local Government Area and the access road to the site having deteriorated beyond use. Comfort Abraham, Enobong Umoh, Edidiong Otu, and Oscar Ita confirmed that the dumping of solid waste in gutters accounted for 13.2 percent of identified flood causation factors in their study on urban flood dynamics. This figure that, in a city generating well over a thousand tonnes of waste daily, translated into a concrete and measurable hydrological threat. The irony was clear given that the city's most expensive piece of environmental infrastructure was being quietly neutralized by its most neglected environmental problem. Meanwhile, per capita waste generation had climbed to 1.34 kg per person per day across the Uyo Capital City Development Area. Projections estimate a 40 percent further increase within a decade which the current landfill remains structurally incapable of absorbing.

Consequences

The most immediate and measurable consequence of waste mismanagement in Uyo between 2018 and 2022 was felt in the bodies of the people living closest to the refuse. The Uyo Village Road dumpsite had been receiving waste since 2013 without engineered containment, and the leachate it generated. The toxic black liquid formed as rainwater percolates through decomposing refuse had, overtime, compromised both groundwater and downstream surface water in the surrounding area. Laboratory analyses of groundwater samples collected around the dumpsite found hazard quotients for lead and cadmium well above unity, 5 to 16 for lead and 3 to 10 for cadmium, indicating a clear and serious risk to anyone consuming water from boreholes in the vicinity. A separate heavy metal study of rainwater collected within the same dumpsite recorded concentrations of cadmium at 1.24 mg/L, cobalt at 0.42 mg/L, and manganese at 0.86 mg/L, with hazard quotients for both cadmium and cobalt exceeding safe thresholds for adults and children alike.

The implications of these figures extended beyond the dumpsite fence as a GIS-based groundwater study of Uyo's urban core found the total coliform bacteria in all sampled boreholes and pH levels below WHO standards in over 90 percent of urban samples. This estimates that approximately 148,922 residents are exposed to substandard groundwater. This burden of contamination happens to be mapped directly onto the city's densest and most commercially active neighbourhoods. The air quality around the dumpsite comprises another major challenge as emissions studies at the Uyo Village Road landfill recorded concentrations of sulphur dioxide and particulate matter PM2.5 which were rated as "unhealthy" on the United States Environmental Protection Agency air quality index, while nitrogen dioxide readings fell in the "unhealthy for sensitive groups" category. The primary healthcare facility sitting within olfactory range of the dumpsite and serves over 500 mothers and infants every single day was therefore operating in conditions that research on ambient air pollution would classify as hazardous to precisely the population groups most vulnerable to respiratory and developmental harm.

The ecological consequences of Uyo's waste crisis did not remain confined to the dumpsite or its immediate environs. As established earlier, the refuse blocking the feeder channels of the N13.6 billion pipe jacking drainage effectively disabled sections of the most expensive piece of flood control infrastructure in the state's history. Comfort Abraham, Enobong Umoh, Edidiong Otu, and Oscar Ita’s work on urban flood dynamics in Uyo identified the dumping of solid waste in gutters as responsible for 13.2 percent of identified flood-causation factors, with the compounding effects of high-cemented urban surfaces, roads without integrated drains, and houses built on natural water channels creating a system in which every heavy rainfall season produced predictable casualties. Uyo's low topographic position, its rapid paving over of previously absorbent land and the steady filling of its drainage arteries with refuse formed a chain of causation that successive desilting campaigns could address only temporarily.

This pattern is similar to what is obtainable within Nigeria's urban centres. Across these metropolises such as Lagos, Abuja and Port Harcourt, an estimated 1.5 million tonnes of solid waste were generated monthly, yet only about 60 percent was collected and managed in any formal sense, meaning that roughly 600,000 tonnes entered the environment through informal channels each month. Uyo's waste generation per capita of 1.34 kg per person per day, measured across a metropolitan

population approaching 1.4 million, placed the city well within this national debacle of uncollected and unprocessed waste degrading the urban water and soil environment.

Conclusion

The case of waste management in Uyo between 2018 and 2022 is, at its core, a challenge about the distance between reputation and reality. For five consecutive years, Akwa Ibom State collected Nigeria's premier environmental award while its capital city generated waste at a rate no existing infrastructure could responsibly absorb. Its single landfill poisoned the groundwater of nearly 150,000 residents, and while the odour from an overstretched dumpsite drifted through the corridors of state power. That the award kept arriving was not evidence of environmental success. It was evidence of how narrow the metrics of environmental measurement can be when they track visible surfaces rather than systemic performance.

The refuse-choked gutters, the saturated market corridors, the blocked drainage channels that turned Uyo's most expensive flood infrastructure into an expensive liability did not emerge suddenly. They accumulated over years of reactive governance, underfunded institutions, and a tendency at the policy level to treat the management of refuse as a matter of optics rather than ecology. The result was a problem too publicly celebrated to be honestly confronted and too deeply structural to be solved by compactor trucks and prosecution drives alone. What Uyo's experience between these years demonstrates is that urban environmental governance cannot be sustained by awards. It requires investment in infrastructure, consistency of enforcement, and the political courage to measure success by what happens to the waste, not merely by how clean the roads appear to the eye.

References

1. Abraham, C., Umoh, E., Otu, E. and Ita, O. "Urban Flood Intricacies and Implications in Uyo Capital City, Akwa Ibom State, Nigeria," Ecology and Advancing Environmental Science, 2023.

2. Afolabi, S. I. and Ikudayisi, A. A. "An Overview of Solid Waste in Nigeria: Challenges and Management," Jordan Journal of Earth and Environmental Sciences Vol. 12, No. 1, 2021.

3. Agunwamba, J. C. "Solid Waste Management in Nigeria: Problems and Issues," Environmental Management Vol. 22, No. 6, 1998.

4. Akindele, A. and Nwagwu, U. "Urbanization, Cities, and Health: The Challenges to Nigeria — A Review," African Health Sciences Vol. 17, No. 4, 2017.

5. Akpan, M. J. D. "Solid Waste Management under COVID-19: A Case Study of Uyo in Akwa Ibom State – Nigeria," Applied Research Journal of Humanities and Social Sciences Vol. 3, No. 4, 2020.

6. Akpan, M. J. D. "Waste Management Agency Practices in Uyo Metropolis: Analysis of AKSEPWMA, Akwa Ibom State, Nigeria," Applied Research Journal of Humanities and Social Sciences Vol. 3, No. 4, 2020.

7. Akpan-Ebe, I. N., Udotong, I. R. and Ekpenyong, R. E. "Ecological Consequences of Urbanization of Uyo Capital City, Akwa Ibom State, Nigeria," Journal of Agriculture and Ecology Research International Vol. 7, No. 3, 2016.

8. Akwa Ibom State Environmental Protection and Waste Management Agency (AKSEPWMA), "About AKSEPWMA," https://aksepwma.ak.gov.ng. (accessed and retrieved, 31 March, 2026).

9. Anthony, L. "Again, Akwa Ibom Assembly Calls for Relocation of Dumpsite in Uyo," Daily Post Nigeria, August 25, 2023, https://dailypost.ng/2023/08/25/again-akwa-ibom-assembly-calls-for-relocation-of-dumpsite-in-uyo/. (accessed and retrieved, 27 March, 2026).

10. Anthony, L. "Environmental Violations: Akwa Ibom Agency to Mount Surveillance on Strategic Places in Uyo," Daily Post Nigeria, October 29, 2024, https://dailypost.ng/2024/10/29/environmental-violations-akwa-ibom-agency-to-mount-surveillance-on-strategic-places-in-uyo/. (accessed and retrieved, 28 March, 2026).

11. Anthony, L. "Wastes Take Over Major Roads, Markets in Akwa Ibom," Daily Post https://dailypost.ng/2023/07/25/wastes-take-over-major-roads-markets-in-akwa-ibom. (accessed and retrieved, 20 March, 2026).

12. Ashameri, I. "Poor Drainage Management Stalls Effort to Tackle Flood, Erosion in A'Ibom," Independent, June 21, 2021, https://independent.ng/poor-drainage-management-stalls-effort-to-tackle-flood-erosion-in-aibom/. (accessed and retrieved, 27 March, 2026).

13. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1989, Art. 2(1), United Nations Treaty Series, Vol. 167.

14. Bassey, U. Tom, A., Okono, U., John, M., Sinn, M.,

Bassey, A., Luke, U. and Narra, S. "Characteristics and Management of Municipal Solid Waste in Uyo, Akwa Ibom State, Nigeria," Scientific Reports Vol. 14, 2024.

15. BusinessDay, "Akwa Ibom Seeks Partnership for Investment in Waste Management," BusinessDay, November 11, 2020, https://businessday.ng/news/article/akwa-ibom-seeks-partnership-for-investment-in-waste-management/. (accessed and retrieved, 21 March, 2026).

16. BusinessDay, "Akwa Ibom's 15,000 Tonnes of Waste Can Be Converted to Wealth," BusinessDay, September 7, 2021, https://businessday.ng/news/article/akwa-iboms-15000-tonnes-of-waste-can-be-converted-to-wealth/. (accessed and retrieved, 21 March, 2026).

17. Effiong, C. "Determinants of Solid Waste Management System in Uyo Metropolis, Akwa Ibom State, Nigeria," Journal of Contemporary Research in Built Environment Vol. 3, No. 1, 2018.

18. Emmason, J. "Akwa Ibom, Ebonyi Named Nigeria's Cleanest States," Leadership, December 2, 2022, https://leadership.ng/akwa-ibom-ebonyi-named-nigerias-cleanest-states/. (accessed and retrieved, 21 March, 2026).

19. Essien, E. and Cyprus, S. "Detection of Urban Development in Uyo (Nigeria) Using Remote Sensing," Land Vol. 8, No. 6, 2019.

20. Eyo, E. I., Tom, A. A. and Itohowo, A. "Policy Implications and Public Health Risks of Contaminated Groundwater in Urban Nigeria: A GIS-Based Case Study of Uyo, Akwa Ibom State," International Journal of Research and Scientific Innovation Vol. 13, No. 14, 2026.

21. Mbina, A. A. and Edem, E. E. "Challenges of Urban Waste Management in Uyo Metropolis," Civil and Environmental Research Vol. 6, No. 10, 2014.

22. Novatia Consulting, "Urbanization and Demographic Studies in Nigeria," accessed March 2026, https://novatiaconsulting.com/urbanization-and-demographic-studies-in-nigeria/. (accessed and retrieved, 28 March, 2026).

23. Nta, S. A., Ayotamuno, M. J., Igoni, A. H., Okparanma, R. N. and Udom, I. J. "Application of Hazard Quotient (HQ) for the Assessment of Potential Health Risk of Groundwater Users around Uyo Main Dumpsite," Asian Journal of Advanced Research and Reports Vol. 14, No. 1, 2020.

24. Nta, S. A., Ayotamuno, M. J., Igoni, A. H., Okparanma, R. N. and Udom, I. J. "Health Risk Assessment of Metal Contaminated Rain Water Collected within the Main Refuse Dumpsite at Uyo, Akwa Ibom State," Journal of Engineering Research and Reports Vol. 13, No. 2, 2020.

25. Nwufo, C. C. "Legal Framework for the Regulation of Waste in Nigeria," African Research Review: An International Multi-Disciplinary Journal Vol. 4, No. 2, 2010.

26. Ogu, V. I. "Private Sector Participation and Municipal Waste Management in Benin City, Nigeria," Environment and Urbanization Vol. 12, No. 2, 2000.

27. Ogwueleka, T. C. "Municipal Solid Waste Characteristics and Management in Nigeria," Iranian Journal of Environmental Health Science and Engineering Vol. 6, No. 3, 2009.

28. Okey, E. N., Umana, E. J., Markson, A. and Okey, P. A. "Municipal Solid Waste Characterization and Management in Uyo, Akwa Ibom State, Nigeria," in C. A. Brebbia (ed.), Sustainable Development and Planning VI, Southampton: WIT Press, 2013.

29. Oral Interview with Obot Kingsley, 43 Years, AKSEPWMA Staff, Ikpa Road, Uyo, Akwa Ibom State, 27 March, 2026.

30. Oyebode, O. J. "Solid Waste Management for Sustainable Development and Public Health: A Case Study of Lagos State in Nigeria," ResearchGate (2013), https://www.researchgate.net/publication/280136474. (accessed and retrieved, 18 March, 2026).

31. Ukpong, I. E. and Udofia, E. P. "Domestic Solid Waste Management in a Rapidly Growing Nigerian City of Uyo," Journal of Environment and Earth Science Vol. 1, No. 1, 2011.

32. Umo, I. "How N13.6bn Drainage Is Threatening Lives, Property in Akwa Ibom," Daily Trust, June 21, 2021, https://dailytrust.com/n13-6b-drainage-in-akwa-ibom-threatens-lives-property (accessed and retrieved, 27 March, 2026).

33. Umo, I. "How Poor Waste Management, Ravine Threaten Uyo's N13.6bn Drainage," Daily Trust, July 4, 2021, https://dailytrust.com/how-poor-waste-management-ravine-threaten-uyos-n13-6bn-drainage/. (accessed and retrieved, 27 March, 2026).

34. United Nations Statistics Division, Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, New York: United Nations, 1997.

35. Wikipedia contributors, "List of Governors of Akwa Ibom State," Wikipedia: The Free Encyclopedia, https://en.wikipedia.org/wiki/List_of_governors_of_Akwa_Ibom_State. (accessed and retrieved, 2 April, 2026).