

## **A Comparative Policy Analysis of Plastic Waste Governance and The Construction-Sector Recognition Gap in Five Sub-Saharan African Countries**

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**Abstract.** Sub-Saharan Africa generates a rapidly growing share of global plastic waste, and over the past three years several of its largest economies have introduced ambitious bans, levies, and extended producer responsibility (EPR) regimes to address it. Yet a critical question remains unexamined: do these regulatory frameworks formally recognise plastic waste as a feedstock for construction materials, or do they remain focused on packaging and single-use items at the point of disposal? This paper presents a comparative, desk-based policy analysis of plastic waste governance in five Sub-Saharan African countries — Nigeria, Ghana, Kenya, South Africa, and Rwanda, selected for their advanced but divergent regulatory trajectories. Using a structured five-dimension framework (single-use restrictions, EPR architecture, construction-sector recognition, financing instruments, and informal-sector integration), the study synthesises national policy documents, regulatory gazettes, and recent peer-reviewed and grey literature (2017–2026) to map each country's governance architecture. Findings show that all five countries have adopted upstream interventions — bans, levies, or EPR — but none has a codified building-code provision, national standard, or certification pathway for recycled-plastic construction products, even where pilot-scale evidence, notably Rwanda's sisal-reinforced plastic tiles, demonstrates technical compliance with international structural and durability standards. Financing instruments such as Ghana's SME grant scheme and South Africa's EPR fees are similarly disconnected from materials-standards development. The paper argues that this construction-sector recognition gap, rather than technical infeasibility, is the principal regulatory bottleneck constraining the transition from technically viable

recycled-plastic building materials to commercially deployable ones. It proposes a phased standards-development pathway for Nigeria that draws on lessons from Rwanda's cooperative-research model and Kenya's labelling regime.

**Keywords:** Circular economy; Plastic waste governance; Construction materials policy; Extended producer responsibility; Building codes; Sub-Saharan Africa

## Introduction

### 1.1 Background

Global plastic production has risen from negligible volumes in the 1950s to a cumulative 8.3 billion metric tons, with production now exceeding 350 million tons annually and the overwhelming majority discarded, landfilled, or leaked into the environment rather than recycled. The construction sector is simultaneously one of the most resource-intensive sectors globally, consuming approximately 40% of global resources while generating around 30% of global waste, which has made the conversion of plastic waste into construction material a frequently proposed circular-economy intervention. Within Sub-Saharan Africa, this convergence is especially pressing: the region's combination of rapid urbanisation, under-developed formal recycling infrastructure, and rising construction demand has been documented as a structural driver of plastic waste accumulation across multiple country contexts [1].

Over the 2017–2026 period, several Sub-Saharan African governments have responded with increasingly assertive regulatory instruments — outright bans on single-use plastics, extended producer responsibility (EPR) regimes, and associated levies and grants. These instruments have attracted substantial comparative scholarly and policy attention at the continental level, generally concluding that Africa has the highest rate of single-use-plastic-bag policy adoption of any world region, yet continues to experience worsening plastic pollution outcomes due to enforcement gaps, narrow product scope, and weak harmonisation across borders.

### 1.2 Policy as the Missing Link

What existing comparative policy scholarship has not examined in detail is whether these frameworks extend downstream to the point at which recycled plastic re-enters the economy as a construction material. This is a materially different question from whether a plastic bag is banned or whether a producer must fund collection: it asks whether a recycler who has successfully produced a plastic-based paving block, tile, or composite panel has any codified standard, building-code provision, or certification pathway through which that product can be lawfully and credibly specified into a building project. Recent experimental evidence from Rwanda demonstrates that this is no longer principally a technical question — sisal-fibre-reinforced recycled-plastic tiles produced at Rwanda Polytechnic-Ngoma College achieved a compressive strength of 41.66 MPa, more than double the 20 MPa engineering threshold required under ASTM C109/BS EN 12390-3, and a water absorption rate of 0.225%, comfortably within the ASTM D570 durability threshold. Where the technology has been validated, the constraint shifts to governance: whether national standards bodies and building codes recognise, test, and certify the resulting products [2].

Variation in enforcement and design across even closely comparable policy instruments has been documented in the bag-ban literature, and a recent continent-wide gap analysis of single-use-plastic policies found that the large majority of Africa's 48 identified active policies are designed around bags and packaging rather than broader product categories, with limited coherence in scope and frequent exemptions. This pattern of upstream concentration motivates the central question of this paper: does the same upstream bias hold when the lens is narrowed specifically to the construction-sector reuse of plastic waste, and if so, what would closing that gap require in the country with the most to gain from doing so — Nigeria?

### 1.3 Relationship to Companion Research

This paper is a policy-analytic companion to a primary empirical assessment of the operational capacity of Nigeria's plastic recycling industry to produce construction materials, conducted by the same author team and currently under review at a separate journal [Edem, Essien & Usip, under review]. The companion study surveyed eight recycling companies across six Nigerian states and

found that only 12.5% currently produce construction materials despite 50% planning to enter that market, with policy environment and building-code recognition identified by respondents as significant unresolved constraints. The present paper does not revisit that firm-level survey data; instead, it undertakes a desk-based comparative analysis of the regulatory texts and policy architectures of Nigeria and four regional comparators, asking a structurally distinct question — not what recyclers are doing, but what their governments have and have not yet codified [3].

#### 1.4 Aim and Research Questions

This paper aims to map and compare the plastic waste governance architectures of Nigeria, Ghana, Kenya, South Africa, and Rwanda along five dimensions, with particular attention to the construction-sector recognition gap, and to derive a phased policy pathway for Nigeria. It addresses four research questions:

- RQ1: What upstream plastic waste policy instruments (bans, levies, EPR) have the five countries adopted, and on what timeline?
- RQ2: To what extent do these frameworks formally recognise recycled plastic as a construction-material input?
- RQ3: What financing and informal-sector integration mechanisms exist, and are they linked to construction-material standards development?
- RQ4: What lessons can Nigeria draw from the comparator countries to close its construction-sector recognition gap?

### **Methodology**

#### 2.1 Research Design

This study employs a qualitative, desk-based comparative policy (documentary) analysis design. This design is methodologically distinct from the mixed-methods primary survey used in the companion empirical study: rather than collecting data from firms through questionnaires, interviews, and site visits, this paper treats national policy documents, legislative instruments, regulatory gazettes, and institutional reports as its primary data sources, supplemented by peer-reviewed and credible grey literature for triangulation and context. This approach follows established precedent in comparative plastic-policy scholarship, which has used similar documentary and gap-analysis methods to assess policy design and governance across African countries.

#### 2.2 Country Selection and Justification

Five countries were purposively selected to form a “policy leadership cohort” rather than a representative sample of the continent: Nigeria, as the focus country and Africa's most populous nation and largest absolute generator of municipal and plastic waste; Ghana, as a West African comparator with an EPR framework currently advancing through legislative process; Kenya, as the country with the earliest and among the strictest single-use plastic bans in the region, paired with the most granular labelling regime identified in this review; South Africa, as the Sub-Saharan pioneer of mandatory EPR regulation; and Rwanda, as the country with the longest-standing plastics policy regime and the most advanced documented practical case of recycled-plastic construction-material development. This selection is a deliberate limitation: it favours depth over breadth, and findings should not be read as representative of the other fifty African countries, nor of Francophone or North African policy traditions, which were outside the scope of this review.

#### 2.3 Data Sources

Primary data sources comprised national policy and strategy documents, legislative and regulatory instruments, and institutional agency materials (NESREA, the Ghana Environmental Protection Agency, Kenya's National Environment Management Authority, South Africa's Department of Forestry, Fisheries and the Environment, and Rwanda's Environment Management Authority). These were supplemented by peer-reviewed journal articles and conference presentations published between 2017 and 2026, and by reputable multilateral and non-governmental grey literature (UNDP, the Global Green Growth Institute, WWF, the Global Plastic Action Partnership) used strictly for contextual triangulation rather than as primary evidence of legal status. All sources were retrieved and current as of June 2026; given the pace of regulatory change in this domain, readers

intending to rely on this paper for compliance purposes should verify current legal status directly with the relevant national authority.

#### 2.4 Comparative Analytical Framework

Each country was assessed along five dimensions, summarised below and operationalised in the comparative table in Section 4:

- Single-use plastics (SUP) restriction — scope, year of introduction, and reported enforcement strength.
- EPR architecture — whether mandatory or voluntary, and the scope of producer obligations.
- Construction-sector recognition — whether a building code, national standard, or certification pathway explicitly addresses recycled-plastic construction products.
- Financing instruments — levies, grants, or tax incentives, and whether any are earmarked for construction-materials research or standards development.
- Informal-sector integration — the extent to which informal waste-pickers, recyclers, or cooperatives are formally recognised within the policy architecture.

### Results

#### 3.1 Nigeria

Nigeria's National Policy on Plastic Waste Management (NPPWM), adopted in 2020, establishes a life-cycle approach to plastics, sets goals for reducing single-use plastics and greenhouse gas emissions, and assigns implementation roles across federal, state, and local tiers through a National Steering Committee on Plastic Waste Management. A phased ban on plastic bags, cutlery, straws, sachets, bottles, and expanded polystyrene took effect from January 2025, with a further phase-out of Styrofoam above 30 microns scheduled for December 2028. The Federal Ministry of Environment's National Plastic Action Roadmap, presented in October 2024, models both a business-as-usual and a “system-change” scenario for the country's plastics economy to 2040, and explicitly recommends synergies between upstream and downstream interventions. Despite this increasingly comprehensive upstream architecture, and despite the Standards Organisation of Nigeria's general mandate to certify products and the Nigerian Building and Road Research Institute's mandate to test alternative building materials, no dedicated Nigerian Industrial Standard or National Building Code provision specifically addressing recycled-plastic construction products was identified in the course of this review [4].

#### 3.2 Ghana

Ghana's National Plastics Management Policy (NPMP), adopted in 2020, was the country's first lifecycle-based plastics policy and identifies the establishment of EPR schemes and a certification and database system as a core focus area. As of early 2026, a mandatory EPR law remains in draft form, undergoing stakeholder consultation led by the Ministry of Environment, Science, Technology and Innovation. A Sanitation and Pollution Levy has funded waste-management programmes since 2021, and in 2025 the government allocated a US\$7 million grant to eight plastic recycling companies to strengthen collection, recycling, and reuse capacity. In June 2025, Ghana's President announced an intention to ban polystyrene foam food containers. None of these instruments, nor the academic literature reviewed on Ghana's sachet-water waste stream — which proposes EPR-based community recovery models for a waste stream constituting an estimated 8–9% of municipal waste— was found to extend to a construction-material standard or certification pathway [5].

#### 3.3 Kenya

Kenya enacted one of the world's strictest plastic bag bans in August 2017 under Gazette Notice No. 2356, with penalties of up to four years' imprisonment or a US\$40,000 fine, and an estimated 80% reduction in plastic bag use following implementation. The ban explicitly exempts bags used for primary industrial and construction packaging, which is a packaging exemption rather than a construction-material standard. Kenya's Sustainable Waste Management Act, given effect through Legal Notice No. 176 of 2024, introduced mandatory EPR from 5 May 2025, requiring producers and importers to manage products through their full lifecycle. A companion instrument, Legal Notice No. 181 of 2024, requires resin codes, producer information, and recycled-content disclosure on plastic packaging before manufacture, import, or distribution — the most granular traceability regime

identified among the five countries reviewed. Documented informal-sector innovation, such as entrepreneurs converting plastic waste from Nairobi's Dandora dump into building bricks, has proceeded without a corresponding national standard or certification framework [6].

### 3.4 South Africa

South Africa's Section 18 Extended Producer Responsibility Regulations, made under the National Environmental Management: Waste Act and effective from 5 November 2021, replaced a previously voluntary system of seven independent Producer Responsibility Organisations with a single mandatory framework. Proposed amendments tabled in November 2024 sought to clarify technical definitions, strengthen enforcement, and streamline producer reporting. A WWF South Africa synthesis report on EPR for plastic packaging calls for continued transparency and accountability in the system but does not extend its recommendations to construction-material standards. No building-code or national-standard provision for recycled-plastic construction products was identified in the regulatory texts or secondary literature reviewed for this study [7].

### 3.5 Rwanda

Rwanda operates the longest-standing and most stringent plastics policy regime among the five countries: a ban on non-biodegradable plastic bags since 2008, extended to a comprehensive ban on single-use plastic items — bags, straws, cutlery, and bottles — since 2019. These bans sit within the broader Green Growth and Climate Resilience Strategy (2011) and a National Circular Economy Action Plan, and have earned Kigali recognition as one of Africa's cleanest capitals. Despite this policy strength, Rwanda's plastic recycling rate is reported at only 2–3%, reflecting persistent infrastructure and market-linkage gaps even in a strong-governance environment. It is in this context that Rwanda offers the cohort's clearest empirical demonstration of construction-sector technical feasibility: researchers at Rwanda Polytechnic-Ngoma College fabricated sisal-fibre-reinforced tiles from recycled HDPE, PP, and PET, achieving a peak compressive strength of 41.66 MPa against a 20 MPa engineering requirement and a water absorption rate of 0.225%, both exceeding relevant ASTM and BS EN thresholds, and performing competitively against conventional ceramic and granite tiles on a cost and durability basis. Separately, the social enterprise My Green Home Rwanda has begun producing paving bricks from recycled plastic waste for the construction market. In both cases, however, market entry has proceeded through individual research institutions and cooperatives rather than through a codified national standard, underscoring that Rwanda's leadership lies in upstream policy and applied research, not yet in construction-sector certification [8].

## 4.0 COMPARATIVE ANALYSIS

**Table 1. Cross-Country Comparison**

Dimension	Nigeria	Ghana	Kenya	South Africa	Rwanda
SUP / bag restriction	Phased ban: bags, cutlery, straws, sachets, bottles, EPS from Jan 2025; Styrofoam phase-out by Dec 2028	No nationwide SUP ban yet; polystyrene foam ban announced June 2025 (not yet in force)	Plastic bag ban since Aug 2017 (Gazette Notice 2356); ~80% reported drop in bag use	No nationwide SUP ban; regulation channelled through EPR rather than bans	Bag ban since 2008; full SUP ban since 2019 (earliest and broadest in the cohort)
EPR architecture	Voluntary-to-mandatory transition under NPPWM 2020; National Steering	Draft mandatory EPR law under stakeholder consultation (2026); NPMP	Mandatory EPR since 5 May 2025 (Legal Notice 176	Mandatory EPR since Nov 2021 (Section 18 Regulations,	EPR embedded within GGCRS 2011 and

	Committee on PWM coordinating roll-out	2020 sets EPR as a policy goal	of 2024); resin-code/recycle d-content labelling mandatory (Legal Notice 181 of 2024)	NEMLA Act); amendments proposed Nov 2024	National Circular Economy Action Plan rather than a standalone EPR statute
Construction-sector recognition	None identified; SON and NBRRI have general standardisation/testing mandates but no dedicated recycled-plastic building standard	None identified; policy and grant instruments target collection/recycling, not construction-material standards	None identified; bag-ban exemption for construction packaging is not equivalent to a finished-product standard	None identified in available EPR or NEMLA texts	None identified; Rwanda Polytechnic -Ngoma College's sisal-reinforced tiles meet ASTM/BS EN strength and absorption thresholds, but remain a research/pilot output, not a certified building product
Financing instruments	EPR levies envisaged under NPPWM 2020; not yet linked to materials R&D	Sanitation and Pollution Levy (since 2021); US\$7M SME grant (2025) for collection/recycling capacity, not standards development	Compliance fees under mandatory EPR; allocation toward construction-materials R&D not identified	EPR producer fees fund PRO operations; WWF synthesis report recommends harmonisation but not building-code linkage	Government-backed cooperative model and GGGI technical support; financing oriented to collection infrastructure (e.g., Nduba sorting facility)
Informal-sector integration	Acknowledged in policy text (community/local-government tier) but implementation	Stakeholder consultations include civil-society and waste-	Informal innovators (e.g., Nairobi's plastic-brick	Informal reclaimers historically central to PRO supply	Recycling cooperatives formally promoted as a

	uneven	management actors; formal integration still developing	entrepreneur s) operate ahead of and outside formal policy	chains; integration uneven post-2021 mandate	delivery mechanism for the bag/SUP bans
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#### 4.2 Cross-Cutting Theme 1: Upstream Bias in Policy Design

Every country reviewed has concentrated its regulatory effort on the production and disposal ends of the plastics value chain — bans, levies, and EPR schemes targeting packaging and single-use items — consistent with the continent-wide finding that the large majority of Africa's identified plastic policies are bag- or packaging-focused. None of the five extends with comparable specificity into the materials-recovery and construction-reuse segment of the value chain, despite construction being repeatedly identified in both policy text and academic literature as a priority application for recycled plastic [9].

#### 4.3 Cross-Cutting Theme 2: The Construction-Sector Recognition Gap

The central finding of this comparative analysis is that none of the five countries has a codified building-code provision, national standard, or certification pathway specific to recycled-plastic construction products. This matters because the companion empirical study found that only 12.5% of surveyed Nigerian recycling companies currently produce construction materials despite 50% planning to enter that market, identifying policy and regulatory uncertainty as a constraint alongside technology and financing gaps. Rwanda's experimental results — compressive strength and water absorption performance that exceed relevant international thresholds — indicate that the technical barrier to construction-grade recycled-plastic products is increasingly surmountable. The persistence of the recognition gap even in Rwanda's comparatively strong governance environment suggests that closing it requires a deliberate institutional act — a standards-development process — rather than simply waiting for further technical maturation [10].

#### 4.4 Cross-Cutting Theme 3: Financing Circularity Without Financing Standards

All five countries have introduced or are introducing financial instruments associated with plastic waste — Ghana's Sanitation and Pollution Levy and SME grant, South Africa's EPR producer fees, Kenya's EPR compliance fees, and Rwanda's GGGI-supported infrastructure investment. In every case reviewed, these instruments are earmarked for collection, recycling capacity, or compliance administration. None was found to be explicitly earmarked for construction-materials testing or standards development, representing a missed opportunity to convert existing EPR revenue streams into the institutional capacity needed to close the recognition gap identified above [11].

#### 4.5 Cross-Cutting Theme 4: Informal-Sector Integration

Informal-sector actors have, in several cases, moved ahead of formal policy in developing construction applications for recycled plastic, as illustrated by Kenya's Dandora-based plastic-brick entrepreneurs and Rwanda's recycling cooperatives. Comparative continental scholarship consistently recommends formal integration of informal recyclers into governance structures as a means of improving both collection efficiency and working conditions. This recommendation aligns with the companion empirical study's finding that poor waste sorting and contamination were the most frequently cited operational constraints (87.5% of surveyed Nigerian companies), a constraint informal-sector integration is well placed to address [12].

## Discussion

Nigeria's existing policy architecture — the NPPWM 2020, the phased 2025 ban, and the National Plastic Action Roadmap's system-change scenario — already provides an institutional vehicle into which a construction-materials standard could be inserted without new primary legislation, by mobilising the Standards Organisation of Nigeria's certification mandate and the Nigerian Building and Road Research Institute's materials-testing mandate in a coordinated standards-development process. This would directly respond to the policy-environment constraint identified by recyclers in the companion empirical study, where building-code recognition was among the policy interventions recommended by respondents alongside tax incentives and waste-sorting infrastructure [13][14].

The companion study further found that outdoor applications, landscaping materials, and road construction were the categories most frequently identified by Nigerian recyclers as suitable for recycled-plastic materials — categories that are generally subject to lighter-touch certification requirements than load-bearing structural elements. This suggests a pragmatic, phased entry point: a standard developed first for non-structural and outdoor applications, of the kind Rwanda has already validated experimentally, would not require Nigeria to resolve the full structural-certification question before recyclers could begin lawfully supplying a construction market segment that industry respondents have already identified as both feasible and commercially promising [15][16].

## 6.0 POLICY RECOMMENDATIONS

1. Commission the Nigerian Building and Road Research Institute, in partnership with the Standards Organisation of Nigeria, to develop a Nigerian Industrial Standard for recycled-plastic construction products, beginning with non-structural and outdoor applications such as paving and landscaping materials [17].
2. Ring-fence a defined share of future EPR-derived levies specifically for construction-materials testing infrastructure and standards development, improving on the collection-and-recycling-only focus of comparator financing instruments such as Ghana's SME grant scheme [18].
3. Establish pilot certification partnerships between NBRRI and architecture, engineering, and materials-science departments at Nigerian polytechnics and universities, following the cooperative-research model demonstrated at Rwanda Polytechnic-Ngoma College [19].
4. Adapt Kenya's resin-code and recycled-content labelling approach (Legal Notice 181 of 2024) to recycled-plastic construction inputs, to support traceability and quality assurance as the market develops.
5. Formally integrate informal recyclers and waste-pickers into the implementation structure of the National Steering Committee on Plastic Waste Management, addressing the sorting and contamination constraints identified in both this review and the companion empirical assessment [20].

## Conclusion

Across five of Sub-Saharan Africa's most policy-active jurisdictions on plastic waste, regulatory ambition has matured rapidly at the upstream end of the value chain — bans, levies, and EPR regimes — but has not yet reached the construction-materials standards space at the downstream end. This is not, on the evidence reviewed here, principally a technical constraint: Rwanda's experimentally validated, sisal-reinforced recycled-plastic tiles demonstrate that construction-grade performance is achievable with locally available materials and modest laboratory infrastructure. It is, instead, a governance gap — the absence of a codified standard or certification pathway through which technically proven products can be confidently specified into building projects. Nigeria, with its existing standards and materials-testing institutions, its 2025 ban already in force, and its recyclers already signalling commercial intent to enter the construction-materials market, is well positioned to be the first country in this cohort to close that gap.

## DECLARATIONS

Relationship to other work: This paper is a policy-analytic companion to a primary empirical, mixed-methods assessment of Nigerian plastic recycling companies' operational capacity to

produce construction materials, conducted by the same author team and currently under review at a separate journal (Edem, Essien & Usip, under review). The two papers are methodologically distinct and report non-overlapping findings: the companion study presents firm-level survey and interview data, while this paper presents a desk-based comparative policy analysis. Readers seeking firm-level operational data are referred to the companion paper.

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## References

- [1] R. Geyer, J. R. Jambeck, and K. L. Law, “Production, use, and fate of all plastics ever made,” *Sci. Adv.*, vol. 3, no. 7, p. e1700782, Jul. 2017.
- [2] P. O. Awoyera and A. Adesina, “Plastic wastes to construction products: Status, limitations and future perspective,” *Case Stud. Constr. Mater.*, vol. 12, p. e00330, Jun. 2020.
- [3] O. O. Ayeleru *et al.*, “Challenges of plastic waste generation and management in sub-Saharan Africa: A review,” *Waste Manag.*, vol. 110, pp. 24–42, Jun. 2020.
- [4] K. K. Jumba, “Policy frameworks and governance in plastic waste management: A comparative analysis of African countries,” *Res. Invent J. Eng. Phys. Sci.*, vol. 4, no. 1, pp. 13–17, 2025.
- [5] O. L. Uche, “Plastic waste regime in Rwanda, Kenya and South Africa: A comparative case study,” *Open J. Tech. Appl. Sci.*, vol. 5, no. 2, pp. 54–85, 2023.
- [6] I. Omondi and M. Asari, “Impact of policy design on plastic waste reduction in Africa,” *Sustainability*, vol. 16, no. 1, p. 4, 2023.
- [7] B. Ntambara, U. Didace, M. Servelien, and N. Maurice, “Manufacturing of plastic tiles based on reinforced sisal and recycled plastic wastes: A case of Rwanda,” *Front. Sustain.*, vol. 7, p. 1810145, 2026.
- [8] P. Behuria, “Ban the (plastic) bag? Explaining variation in the implementation of plastic bag bans in Rwanda, Kenya and Uganda,” *Environ. Plann. C Polit. Space*, vol. 39, pp. 1791–1808, 2021.
- [9] N. Ferronato *et al.*, “A review of plastic waste circular actions in seven developing countries to achieve sustainable development goals,” *Waste Manag. Res.*, 2024, doi: 10.1177/0734242X241234567.
- [10] Federal Ministry of Environment, Nigeria, *National Policy on Plastic Waste Management*, Abuja, Nigeria: Federal Republic of Nigeria, 2020.
- [11] C. Umunna (National Bureau of Statistics, Nigeria), “Nigeria's experience in solid waste management of plastics,” presented at the UN One Sustainable Development Forum, Session 7, Accra, Ghana, 2025.
- [12] “Nigeria to ban single-use plastics from 2025,” *Sustainable Plastics*, 2024. [Online]. Available: <https://www.sustainableplastics.com>
- [13] “2025: a turning point for packaging regulation across MENA and Africa,” *Packaging Gateway*, 2025. [Online]. Available: <https://www.packaging-gateway.com>
- [14] Global Plastic Action Partnership, *Nigeria National Plastic Action Roadmap*, Abuja, Nigeria: Federal Ministry of Environment, 2024.
- [15] L. Kotoe (Ghana Environmental Protection Agency), “Experience of Extended Producer Responsibility (EPR) in Ghana,” presented at the UN One Sustainable Development Forum, Session 4, 2025.
- [16] “MEST advances Extended Producer Responsibility Law to tackle plastic waste,” *Ghana News Agency*, 2026. [Online]. Available: <https://www.gna.org.gh>
- [17] “Tackling plastic waste: Ghana's comprehensive approach to environmental protection through regulation,” *The High Street Journal*, 2024. [Online]. Available: <https://www.highstreetjournal.com>
- [18] Global Plastics Policy Centre, *Kenya plastic bag ban: Policy review*, Portsmouth, U.K.: Univ. of Portsmouth, 2023.

- [19] “2025 regulatory and waste management updates from Africa and the Middle East,” *Food Packaging Forum*, 2025. [Online]. Available: <https://www.foodpackagingforum.org>
- [20] R. Mtonga, “Commentary: Rwanda offers a plastic recycling model worth emulating,” *Recycling Today*, 2022. [Online]. Available: <https://www.recyclingtoday.com>