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From Waste to Wealth: Strengthening the PET Value Chain in Nigeria

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Executive Summary

Polyethylene terephthalate (PET) is a lightweight, durable, and versatile plastic used extensively in global packaging, especially within the food and beverage sector. While it is a preferred material in consumer-packaged goods due to its durability and safety, its ubiquity has created a profound environmental burden.[1] Designed for single-use consumption and requiring centuries to decompose,[2] discarded PET bottles frequently overwhelm waste management systems. Although PET is technically recyclable, recovery efforts struggle to keep pace with production, resulting in significant leakage into landfills and natural ecosystems.

As the most populous nation in Africa, Nigeria faces a particularly acute plastic waste problem. In 2025, the country generated 500K metric tons (MT) of PET waste. Despite an active informal recovery sector, ~90% of the country's waste remains mismanaged,[3] clogging waterways, filling informal dumpsites, or being openly burned. Currently, only 40-50% of annual PET waste is recovered from the environment and 20-25% is recycled domestically. The remaining collected volume is exported, rejected by recyclers due to contamination, or lost through leakage across the value chain.

500K MT/yr	40–50%	20–25%
PET Generated	Collected	Recycled Domestically

Collection and recycling rates are influenced by a complex interplay of socioeconomic and structural factors that vary by state. For example, the operational environment for collection is defined by a distinct set of local drivers and barriers:

- **Collection drivers:** High urban density that concentrates feedstock, proximity to established off-taker hubs, and elevated unemployment that expands the incentives for higher collection rates

[1] Towards a System Change in Plastic Pollution: A Roadmap for the Sustainable Use of Plastics in Nigeria (October 2024)

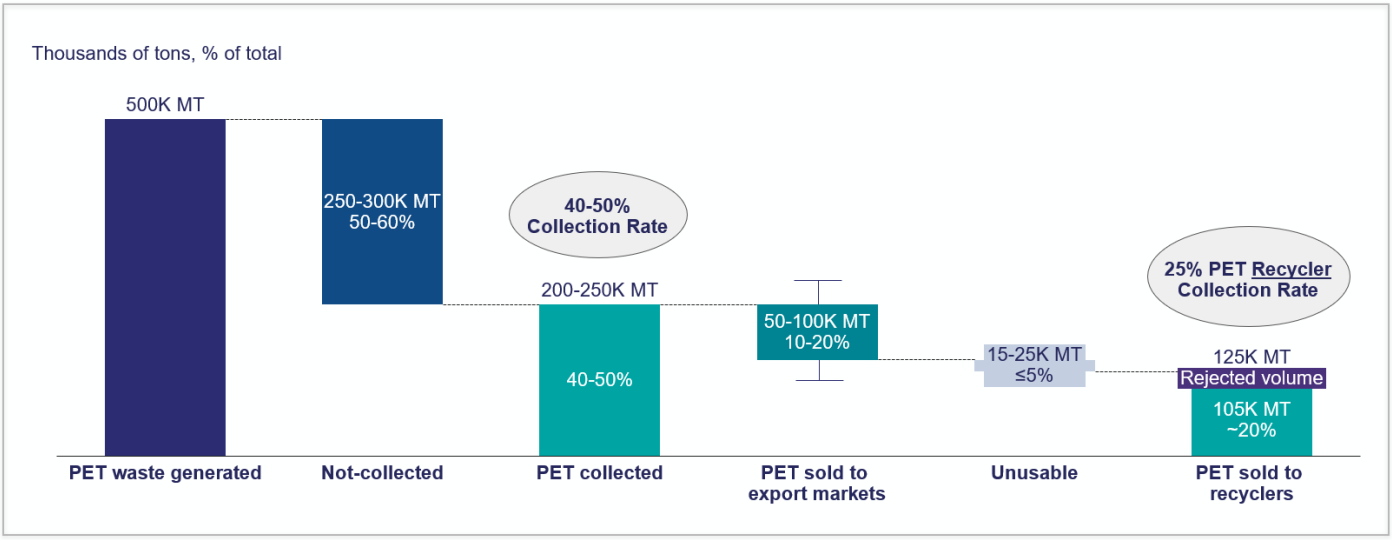
[2] This is how long everyday plastic items last in the ocean, World Economic Forum (Accessed March 2nd, 2026)

[3] Global Plastics Action Partnership, Nigeria (Accessed March 2nd, 2026)

- **Collection barriers:** Regional insecurity, the stigmatization of collectors, and long distances to off-taker hubs

While these factors determine the volume of PET gathered, proximity to recycling facilities influence the final destination of the material. Domestic recycling is currently concentrated across Nigeria's southern zones. For states outside of these logistics networks, international export markets become more attractive in terms of accessibility and profitability. This geographic disconnect creates a "conversion gap" in select states, where high collection does not necessarily translate to domestic recycling. Instead, material is diverted to international markets, which limits the potential for local value addition.

National PET Waste Flow



Systemic challenges currently undermine Nigeria's PET value chain, hindering its environmental and economic potential. Key barriers include:

- **Fragmented and informal collection:** Decentralized and informal recovery results in high contamination rates and an inconsistent supply of quality feedstock
- **High operational costs:** Erratic power supply and high logistics costs erode the price competitiveness of domestic processing
- **Weak policy enforcement:** Inconsistent implementation of regulations, driven by weak penalties and limited budget for enforcement, hinder value chain formalization and undermine systemic stability

Why Now

There is a significant, untapped opportunity to strengthen Nigeria's PET collection and recycling ecosystem to improve environmental outcomes, generate jobs, and capture more value addition domestically. Realizing this potential requires a strategic shift from a fragmented, export-oriented model toward a more coordinated domestic value chain. Momentum is already building; domestic recycling capacity is increasing, with major new investments expected to bring the collection rate for domestic recyclers as high as 35% by the end of 2026.

Three forces are converging to create a narrow window for action:

1. First, domestic recycling capacity is expanding at scale. Polysmart's $60 million commitment to build Nigeria's largest recycling facility is the most visible signal of broader investor confidence.
2. Second, per-capita plastic consumption is projected to grow at 3.6%[4] annually. Without an expansion of collection and recycling capacity, waste will proliferate in the environment.
3. Third, new regulations mandating recycled content thresholds are creating durable, captive demand for domestically sourced rPET — often at attractive discounts to virgin imports.

Together, these dynamics shift the question from whether Nigeria's PET sector formalizes to how quickly stakeholders move to capture the opportunity.

Investing in targeted interventions along the value chain – from collectors and aggregators to recyclers and the broader enabling environment – will improve the livelihoods of those working in the sector while also boosting collection and recycling rates. A summary of key interventions is outlined below.

[4]Market Assessment for Plastics Circularity in Nigeria, PWC (2019)

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Interventions by owner

Owner	Intervention category	Interventions
Government	Policy & legislation	• Ensure NESREA has adequate budget to enforce the *National Environmental (Plastic Waste Control) Regulations*
		• Analyze domestic rPET processing capacity, revising threshold regulations as needed; subsequently, enforce legislation
	Market development	• Support the Food & Beverage Recycling Alliance (FBRA)'s efforts to formalize the collection sector by offering government-recognized collect identification cards
	Infrastructure	• Invest in infrastructure and resolving operational challenges (e.g., issues with road safety officials, vehicle permits) that hinder collection and aggregation efforts
Private Sector	Equipment	• Sponsor machinery (e.g., balers, industrial scales) adoption at the aggregator-level via a lease-to-own model
	Policy	• Champion adoption of the *Plastic Waste Control Regulations*, which were gazetted in April 2026
	Economic & structural	• Formalize off-taker agreements with recyclers, specifying volumes/quality requirements to encourage investment and capacity expansion
		• Formally commit to rPET threshold minimums (including those that exceed regulatory requirements)
	Logistics	• Foster entrepreneurs / provide start-up capital to develop additional collection hubs to act as "feeders" to recyclers
Donors	Advocacy	• Support the establishment and formalization of collector cooperatives
		• Encourage joint procurement of transport and equipment (at both the collector and aggregator-level)
	Public awareness	• Launch (youth) education campaigns to raise awareness about the importance of recycling and separation-at-source activities
	Policy support	• Support implementation of Nigeria's EPR framework by sharing technical insights from more mature PRO markets with NESREA (e.g., approaches to calculating EPR fees, developing a functional plastic registry)

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PET in Nigeria: At a glance

500K MT/yr	40–50%	20–25%
PET generated	Collected	Recycled domestically

THE CHALLENGE

Fragmented collection. Decentralized, informal recovery produces high contamination and inconsistent feedstock.

High operational costs. Erratic power and high logistics costs erode the price competitiveness of domestic processing.

Weak policy enforcement. Inconsistent regulation enforcement hinders formalization and undermines investor confidence.

The conversion gap. Up to ~40% of collected PET is exported rather than processed locally, limiting domestic value addition.

WHY NOW

Capacity is scaling. Polysmart's $60M facility and other expansions could lift recycler collection to ~35% by end of 2026.

Feedstock supply is structural. Per-capita plastic consumption is growing at 3.6% annually, ensuring sustained PET volume.

Demand is being mandated. Recycled-content thresholds in recent regulations create durable demand for domestically sourced rPET.

Coordination is the constraint. Capital and capacity exist; what's missing is the alignment among owners to deploy them in concert.

PRIORITY ACTIONS BY OWNER

Government	Dedicate adequate resources to enforce the new *Plastic Waste Control Regulations*
Private sector	Formalize off-take agreements with recyclers and commit to rPET threshold minimums above the regulatory floor.
Donors	Increase public awareness about recycling, support implementation of the EPR framework, and advocate for informal players along the value chain

The call to action: Move beyond independent pilots to a coordinated, systems-level coalition that closes the conversion gap and anchors a domestic PET value chain.

1.0 Introduction to study and methodology

Methodology

The study, carried out by TechnoServe in partnership with The Coca-Cola Foundation, sought to establish a reliable, evidence-based national estimate of PET collection and recycling rates to guide future interventions. Beyond determining this national baseline, the research assessed critical demand-side dynamics — including pricing mechanisms, the off-taker environment, and price structures that determine material flows — while reviewing the regulatory landscape to identify actionable policy recommendations to strengthen the ecosystem.

The work was executed in three distinct phases between May 2025 and February 2026, enabling the study team to refine assumptions through an iterative data collection process.

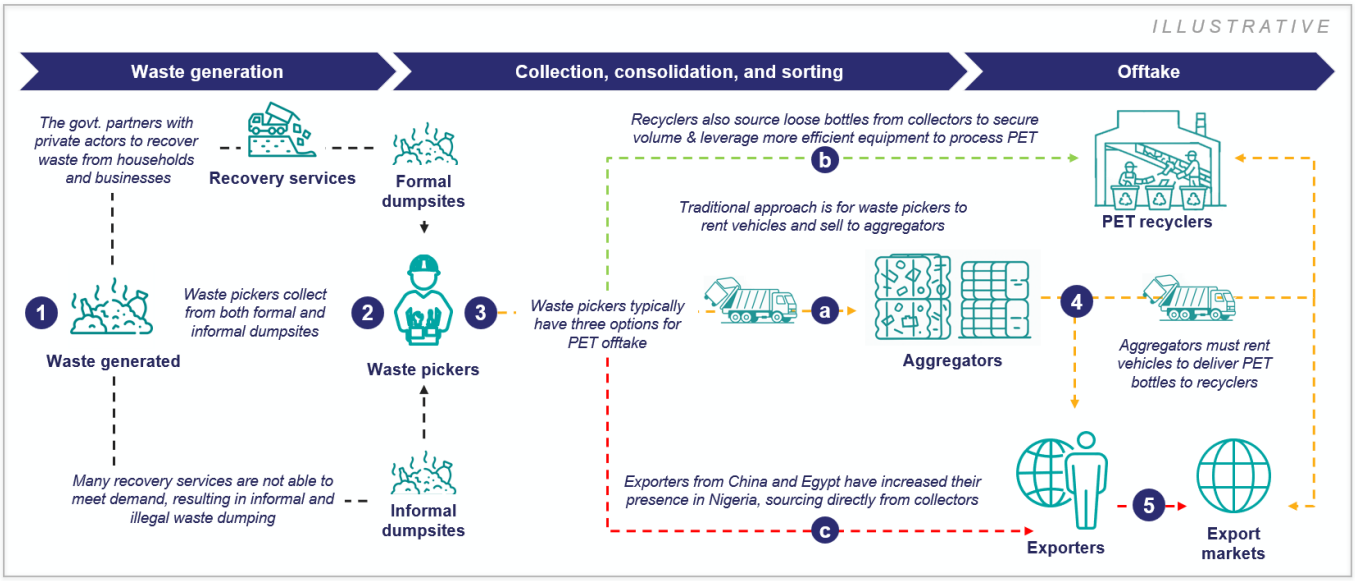
A rigorous multi-stakeholder engagement strategy was employed to gather the data required for the study. The research team conducted 1:1 interviews and Focus Group Discussions with over 500 participants, including collectors, aggregators, recyclers, exporters, associations, PET experts, and government officials. This robust interview approach enabled the team to gather a breadth of perspectives and data points, triangulating findings in a sector with limited formal data.

PET Value Chain 101

Value Chain Players

The PET value chain in Nigeria is non-linear and has multiple actors involved from generation to recycling, including both formal and informal players:

Waste ecosystem and flow



The key players in the value chain and their roles are detailed below:

- **Collectors:** The first stage of the value chain consists of two core groups of collectors: those that operate in dumpsites and those that source site-to-site:
    - **Dumpsite collectors** typically live near formal landfills and collect PET in that location. Many collectors that operate in landfills must pay to collect there.
    - **Site-to-site collectors** source primarily from households, businesses, or the streets. They aim to intercept waste before it reaches dumpsites to avoid paying fees and to preserve bottle quality. These collectors can walk long distances between sites (up to 10 kilometers/day) to source PET.

  Both dumpsite and site-to-site collectors arrange a pickup or rent a tricycle for delivery once their nets are full. Historically, collectors sold exclusively to aggregators, but they now also sell directly to exporters or recyclers. Collectors tend to have limited loyalty to off-takers, selling to whomever will offer the highest price.
- **Aggregators**: Function as the critical bridge between informal collectors and downstream off-takers. Aggregators typically purchase loose bottles, providing cash to collectors immediately upon delivery. There are a variety of pre-processing and processing steps that aggregators perform based on the scale of the business and cash flow. After aggregating substantial volumes of PET, aggregators sell to larger aggregators, recyclers, or exporters.

- **Recyclers:** There are ~10 facilities in Nigeria that recycle PET. These businesses transform used PET into new recycled PET (rPET). Recyclers can either produce food-grade rPET - which necessitates high quality feedstock inputs and additional processing activities – or non-food-grade rPET. Food-grade rPET is sold in resin form to bottlers or exported by the recyclers, while non-food-grade rPET is exported or sold to domestic manufacturers to develop into new products (belts, textiles)
- **Exporters:** As documented during the study's fieldwork, exporters are typically from China, Egypt, India, or the Middle East, and maintain a strong on-the-ground presence via local agents. By building direct relationships with collectors and aggregators, exporters compete directly with domestic recyclers for feedstock. The specifications for exported PET are dictated by the end-market destination:
    - **Europe:** Buyers primarily demand food-grade cold washed flakes. These are often preferred over post-consumer recycled (PCR) resin for superior quality control.
    - **Asia:** Buyers are typically textile companies that prioritize lower-quality and lower-cost non-food-grade cold washed flakes.

  While exporters have historically played a prominent role in the PET value chain, this may change due to recent policy shifts. Effective April 1, 2026, the Federal Government prohibited the export of rPET to promote domestic recycling. Given the policy's recent implementation, its full impact on the PET value chain has yet to be determined.[5]

Processing steps and associated value addition

Distinct actors transform PET from waste to high-value material, with each step adding incremental value. An overview of these stakeholders and their key processing activities is outlined below:

[5] Circular, Federal Ministry of Finance, April 1st, 2026

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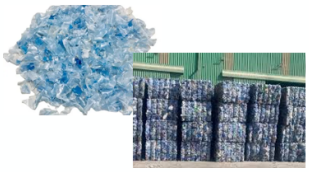
PET processing steps

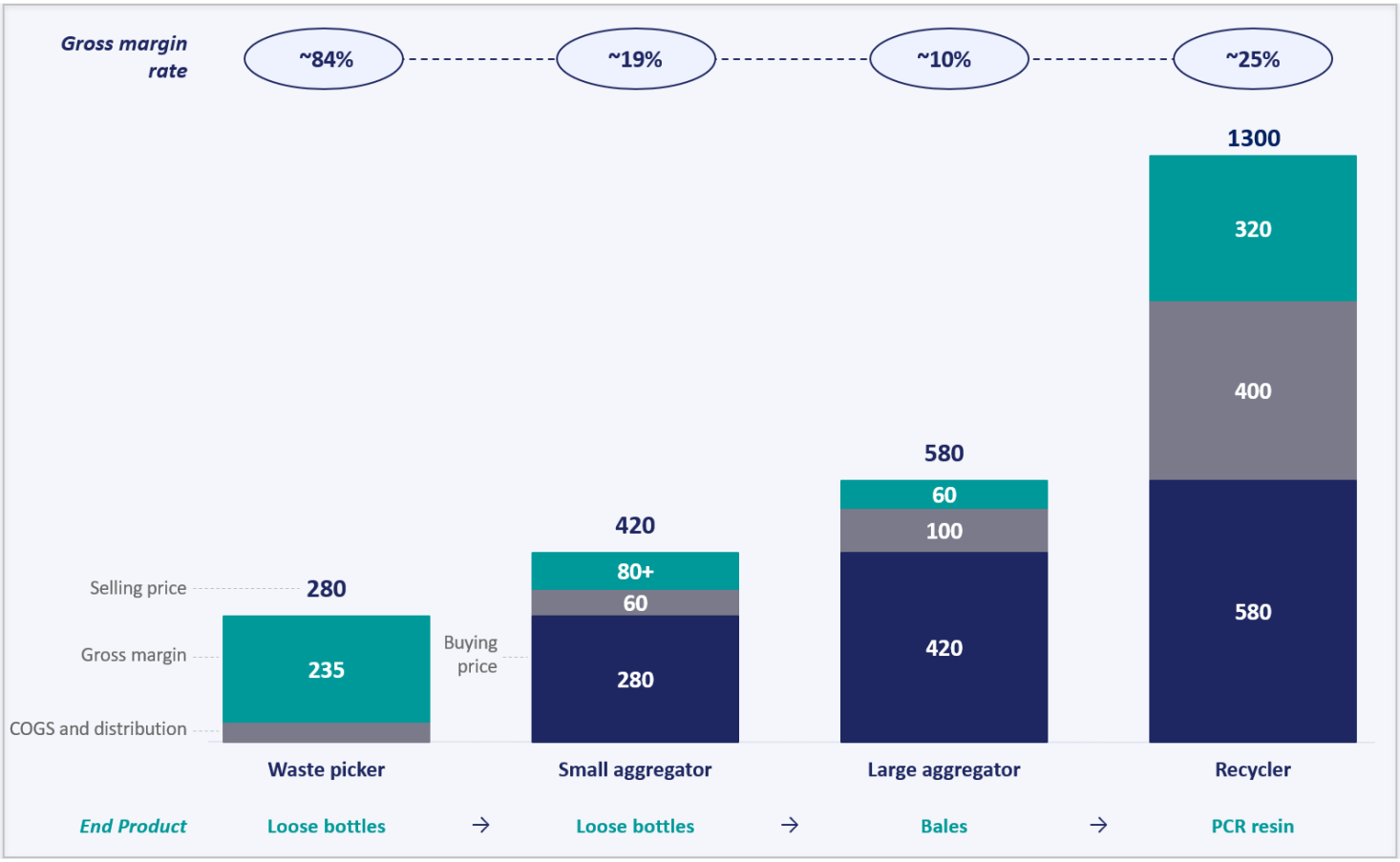
	Collection	Consolidation / initial processing	Processing	Off-take
Actor	• Collection centers	• Aggregators	• MRFs (including industrial manufacturing[3])	• Exporters • Domestic manufacturers
Activity	• PET bottles are collected from formal and informal landfills, households, event centers, etc.	• PET bottles are: - Sorted by material type and color - Baled - Shredded into flakes - Cold washed	• PET bottles are: - Hot washed - Melted according to the intended off-take: ▪ Pellets ▪ String-like filaments - Crystallized and polymerized - Transformed into new rPET products	• rPET products are sold to: - Exporters - Domestic manufacturers, either food-grade (B2B) or non-food-grade (fiber/ textile industry)
Value added	• Aggregation	• Bales: color sorting, manual cleaning, densification (i.e., logistics efficiency) • Flakes: flaking, decontamination	• Sterilization, pelletization, consolidation • Decontamination, transformation into a new rPET product	• Manufacturing into a new product
End product	• Loose and contaminated PET bottles 	• Compressed, color specific bales • Washed/unwashed flakes 	• Washed flakes • Food-grade PET PCR resin • New products (e.g., textile fibers, belt straps) 	• New product 

Legend: Only for food-grade rPET; Only for non-food-grade rPET

Financial incentives along the value chain are contingent on the level of processing applied. Furthermore, clear/light blue PET remains the most sought-after material due to its high recyclability into premium, food-grade resin.

The following analysis provides a granular breakdown of pricing and processing dynamics as of Q3 2025. It illustrates how market value increases as material is refined into high-value PCR resin, while noting that the most significant margins are captured during initial collection:

Process flow and value addition (₦/kg, Price in Q3 2025 for white/blue PET)



Challenges undermining the value chain

The Nigerian PET value chain is undermined by several systemic inefficiencies. Stakeholders face logistical, financial, and regulatory hurdles that limit collection and recycling efforts.

Collectors

Collectors operate under challenging conditions that constrain their productivity and compromise their physical well-being. The collectors interviewed during the study highlighted five recurring challenges that undermine their ability to source PET:

Logistics and high transport costs

Collectors identify transportation as the most significant hurdle to scaling recovery volumes, citing a lack of essential equipment (e.g., wheelbarrows and trolleys) and prohibitively high costs of moving bulk bottles to aggregation points.

Health and safety challenges

Collectors are exposed to hazardous waste due to inadequate access to personal protective equipment (PPE) such as puncture-resistant gloves, boots, masks, and goggles. This leads to preventable injuries and long-term health issues.

Pricing Volatility

The absence of standardized market pricing leaves collectors vulnerable to sudden market shocks. Unpredictable pricing swings undermine motivation and long-term business viability.

Stigmatization

Collectors face prejudice, intimidation, and even violence. This perpetuates the perception of waste picking as undignified work, which disincentivizes youth from joining the profession and hinders the formalization of the sector.

High Competition

As the economic value of plastic becomes common knowledge, an influx of new collectors has made it more challenging to locate easily accessible and clean PET. While beneficial to the sector, this forces veteran collectors to cover more ground for smaller yields.

> “We are often accused of being thieves and restricted from certain areas, and sometimes are chased or beaten...”
>
> **— Collector, Oyo State**

Aggregators

Aggregators share many of the same challenges as collectors but also face distinct difficulties due to the market structure and their larger scale operations. Key challenges highlighted during stakeholder interviews include:

Prohibitive transportation costs

Aggregators typically bear the cost of transporting PET to off-takers. Depending on the distance to the closest off-taker, these logistics costs can compress margins or make the venture unprofitable.

Working capital constraints

Aggregators pay collectors upfront but are not paid until they sell downstream to off-takers. This creates a working capital constraint that limits their ability to scale operations.

Pricing volatility

As with collectors, price fluctuations make business operations challenging for aggregators. Inventory management has become a particular challenge; if the aggregators inadvertently buy bottles at peak prices, they are forced to either hold stock for long periods or sell at a loss to maintain cash flow.

Equipment challenges

Aggregators lack access to efficient equipment, often relying on manual sorting or operating without balers. This limits their ability to add and capture value. For those with machinery, high maintenance costs and downtime are recurring issues.

Power instability

An unreliable national grid prevents many aggregators from operating at full capacity. Hybrid energy alternatives are often unaffordable or inaccessible.

Market disintermediation

Competition is intensifying as exporters and recyclers increasingly bypass aggregators to source bottles directly from collectors. These off-takers offer collectors a premium price to internalize the supply chain and maintain control over quality, which is altering traditional waste flows.

Recyclers

Domestic recyclers navigate a complex landscape where market pressures and operational inefficiencies often impede growth. Key challenges cited by recyclers include:

Limited off-taker access

Historically, the absence of long-term off-take agreements discouraged capital investment, as recyclers lacked guaranteed buyers for their rPET. However, this trend is starting to shift as players like Polysmart announce significant capacity expansion, signaling growing confidence in the domestic market.

Low utilization

Many recyclers struggle with low utilization due to machine maintenance challenges. Because industrial machinery is imported from China or Europe, there is a shortage of local technicians capable of performing complex repairs.

Poor feedstock quality

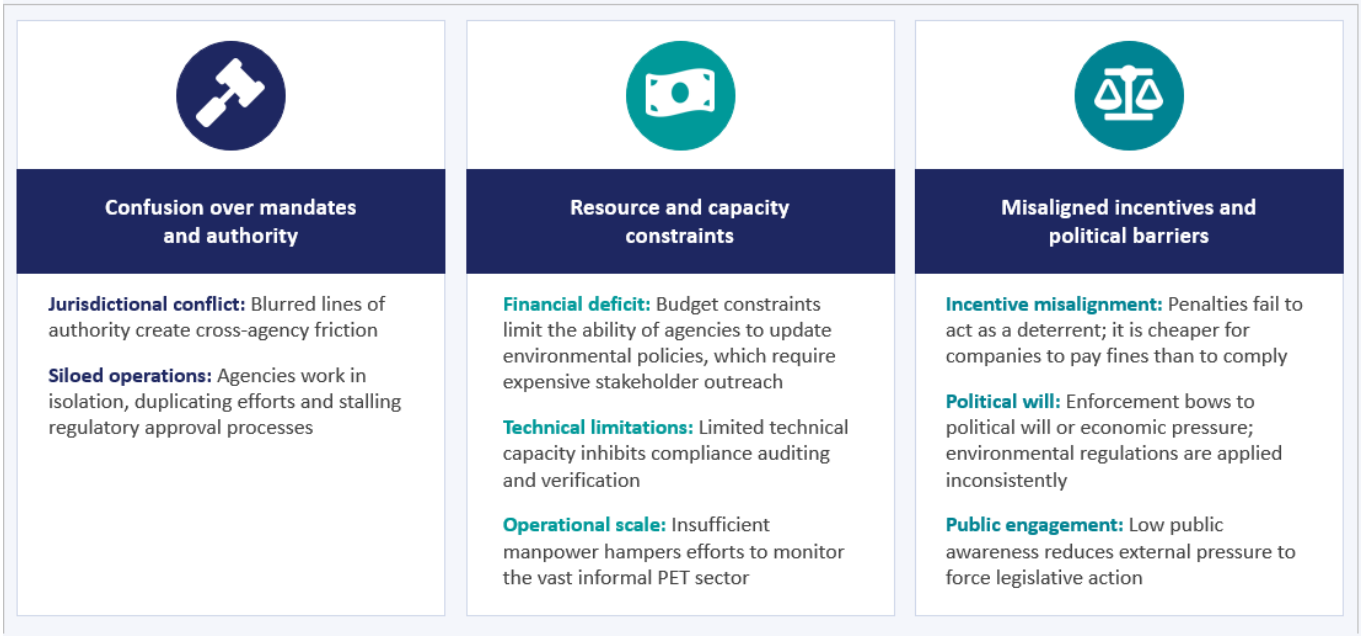
Production is hindered by feedstock contamination, with some food-grade recyclers reporting yield losses exceeding 30% due to a lack of separation-at-source and upstream sorting processes. Competition is most intense for the limited supply of clear and clean PET, prompting domestic recyclers to pursue vertical integration or explore upstream partnerships to secure cleaner, more reliable feedstock.

Enabling Environment

Systemic gaps in policy development and enforcement further compound the challenges experienced by players across the value chain.

Three primary factors have historically undermined the successful implementation of regulations that would support the PET value chain:

Factors undermining successful implementation of regulations



Beyond these policy-specific challenges, several broader environmental factors also impede PET collection and recycling in Nigeria. These challenges reflect the landscape in which stakeholders must operate:

Deficient waste infrastructure

Nigeria's ~40M MT of annual solid waste overwhelms formal recovery—pick-up can take over a week, and with few disposal alternatives, waste is openly burned or dumped.

Low consumer awareness

Outside major cities, low awareness of source separation means PET is routinely mixed with organic waste, contaminating it beyond food-grade use.

Limited data availability

Sparse, localized data on PET generation and recovery makes it hard for agencies like NESREA to track national recycling targets.

Technology and equipment gaps

Many aggregators still hand-sort and delabel—manual processes that are slower and costlier than automation.

Prohibitive financing costs

High interest rates, the informal sector's perceived risk, and no traditional collateral shut most collectors and aggregators out of formal credit.

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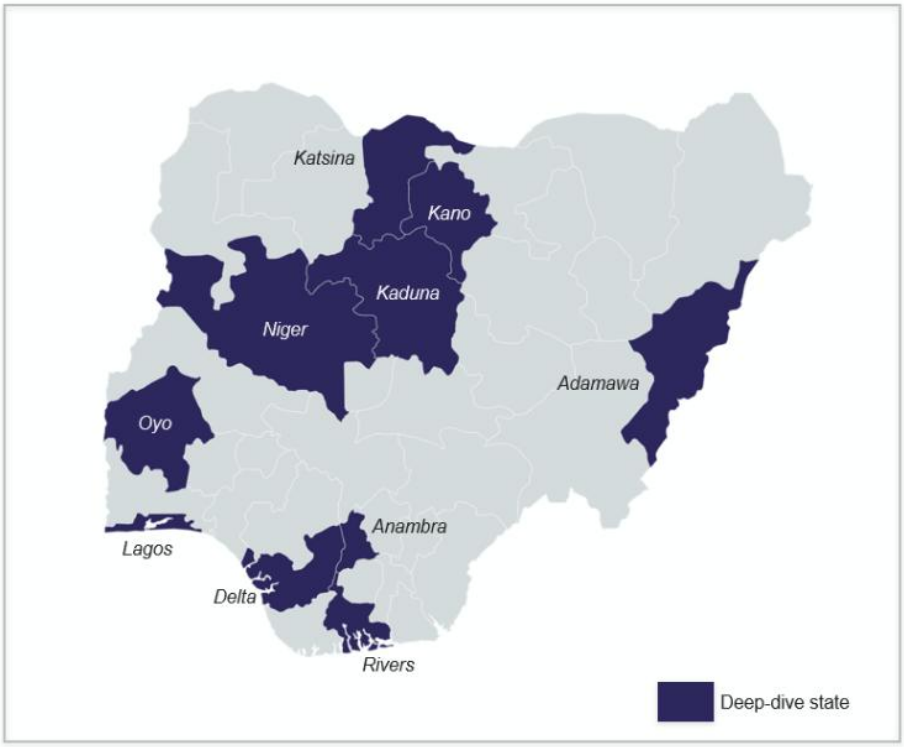
2.0 Deep-dive state and national findings

Deep-dive state findings

To establish a primary, evidence-based national estimate for PET collection and recycling rates, the study team conducted deep-dive research in ten states. These states collectively represent over 50% of Nigeria's total PET waste generation and span all six geographic zones to ensure the findings are significant and representative of the broader national landscape.

The ten deep-dive states — Adamawa, Anambra, Delta, Kaduna, Katsina, Kano, Lagos, Niger, Oyo, and Rivers — were chosen to capture a full spectrum of market dynamics, ranging from high-density commercial hubs to predominantly agrarian regions. The variance in collection and recycling rates across these states indicates that while many market challenges are universal, performance is localized based on socioeconomic drivers and structural enablers.

Map of Nigeria: Deep-dive states

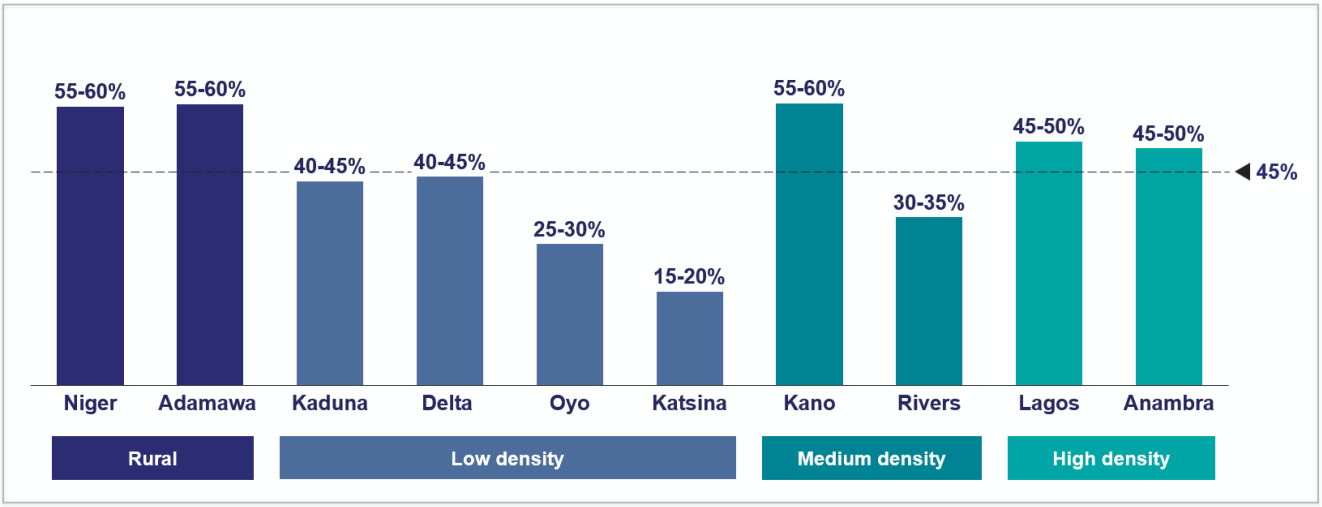


To identify national trends and extrapolate results, the ten deep-dive states were categorized into four state archetypes based on population density:

- **Rural** (<200 people/sq. km): Niger and Adamawa
- **Low density** (200-599 people/sq. km): Delta, Kaduna, Katsina, and Oyo
- **Medium density** (600-1199 people/sq. km): Kano, and Rivers
- **High density** (1200+ people/ sq. km): Anambra and Lagos

Collection Rates

Across the deep-dive states, collection rates ranged from 15-60%, suggesting a national average of ~45% when accounting for the estimated total number of collectors operating in each state and the average volumes they retrieve.



Estimated PET collection rate (%) by deep-dive state

Rural states, such as Niger and Adamawa, along with more densely populated urban hubs, recorded the highest collection rates. On average, low-density states had the lowest collection rates.

Several socioeconomic and structural factors bolster or impede collection efforts. Collection increases where market access is streamlined, off-taker activity is strong, urban density concentrates feedstock, and informal work remains an attractive income source. Inversely, collection declines where structural frictions, such as long distances to off-takers or insecurity, limit participation.

Across the ten deep-dive states, areas with elevated unemployment rates or proximity to strong off-taker markets realize higher collection rates. For example, Adamawa's collection rate of 55-60% is supported by a high unemployment rate (~55%)[6], which drives more individuals to participate in the informal sector. In Kano and Niger, collection benefit from robust access to off-taker markets due to the presence of in-state exporters and/or recycler collection hubs. More densely populated states such as Lagos and Anambra also achieve high collection rates. These outcomes are driven by the high concentration of PET waste and the advantage of in-state access to recycling facilities.

Conversely, states with the lowest collection rates – including Katsina and Oyo – underperform due to a combination of competitive local labor markets and structural disincentives for PET recovery. For example, Katsina realizes a PET collection rate of only 15-20% in part because the state is home to several metal and paper recycling companies that offer premium prices; consequently, collectors prioritize more lucrative materials over PET. Additionally, many collectors in Katsina work part-time sourcing PET (only 5 hours/day), further limiting the total volume retrieved. In Oyo, a relatively low unemployment rate reduces overall participation in the informal collection sector.

Archetype-specific challenges

These broad state-level trends are underpinned by specific operational hurdles. While all collectors in Nigeria face systemic challenges, the study identified unique pain points that vary by state archetype, reflecting the relative maturity of the local PET value chain:

- **Rural (Adamawa, Niger):** Collectors in these states primarily struggle with long distances to market and equipment costs. Due to the relative lack of local aggregation infrastructure, many collectors must travel long distances to reach buyers, which is time-intensive and increases the risk of PET leakage. Additionally, essential equipment like a collection net is expensive, and when off-takers fail to return them, it can create a recurring financial barrier that limits collection efforts
- **Low density (Delta, Kaduna, Katsina, Oyo):** In these states, key challenges include long distances to off-takers and limited access to high-yield collection neighborhoods due to resident concerns over the legitimacy of collectors. The combination of physical distance and social exclusion prevents collectors from capturing the full volume of clean PET generated in wealthier residential zones.

[6] Nigeria Multidimensional Poverty Index (2022)

- **Medium density (Kano, Rivers):** As the value chain matures, collectors increasingly raise two new challenges: a lack of working capital and limited government backing. The absence of sufficient liquid capital limits collectors' ability to source directly from households, which increasingly demand financial compensation for their recyclables. Furthermore, the lack of formal recognition and incentives from the government undermines the legitimacy of the collection sector, making it difficult for collectors to scale operations.
- **High density (Anambra, Lagos):** In the country's most populous urban centers, collectors face a complex environment defined by capital shortages and challenging logistics. Similar to medium-density states, a lack of capital to purchase PET at the point of origin remains a significant bottleneck to boosting collection capacity. Additionally, these collectors must navigate chronic urban congestion and track waste flows across a fragmented array of locations, including markets, event centers, and schools.

> "Worn out nets with a cost for replacement…make it difficult to collect more PET"
>
> **— Collector, Niger State**

> "There is a lack of adequate recognition and incentives from the government"
>
> **— Collector, Kano State**

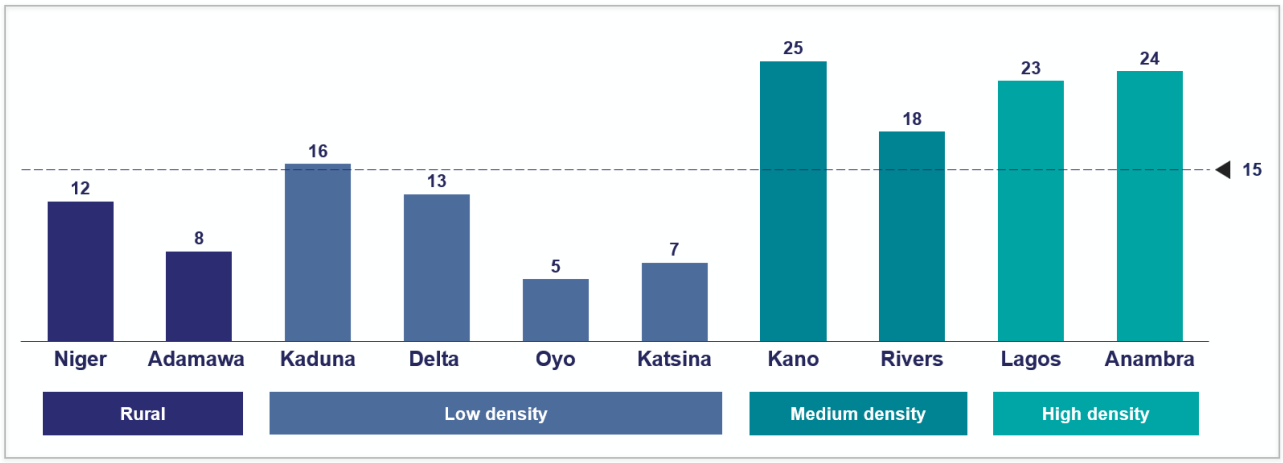
> “We face long distances between collection points and buyers”
>
> — **Collector, Oyo State**

> “Access to capital to buy plastic waste from households…enhances collection capacity”
>
> — **Collector, Lagos State**

Aggregated volumes

The average volumes aggregated across the deep-dive states are influenced by the degree of formality in the collection and aggregation infrastructure:

Aggregated volumes (Per aggregator, monthly MT)



Higher density states (e.g., Kano, Rivers, Lagos, Anambra) realize the greatest aggregated volumes in part because their systems are more formalized and consolidated. In Lagos, which has the most extensive aggregator network in the country, select aggregators source 200MT of

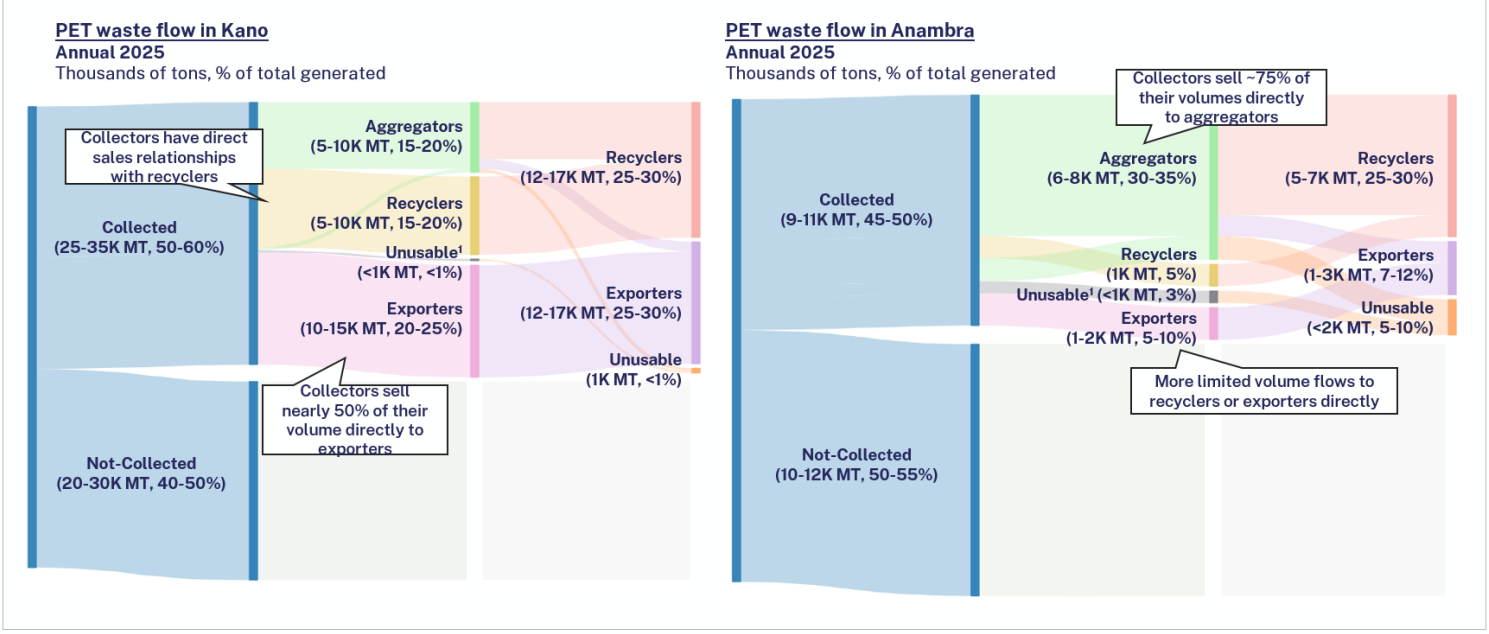
PET per month. Similarly, in Kano, the aggregation is efficient, with players operating at scale and conducting value-add processing.

Lower aggregated volumes are typical in states with more decentralized systems or where aggregators face intense direct competition from other value chain actors. In states like Adamawa, the aggregation sector remains nascent, with limited large-scale operations. As a result, local aggregators typically sell to larger counterparts in Kano rather than to recyclers or exporters directly. In Oyo, aggregated volumes are constrained by the proximity of recyclers and exporters, which may bypass aggregators to buy directly from collectors. Furthermore, recent market volatility has led some aggregators to intentionally reduce their demand to manage inventory risk.

While aggregated volumes indicate the scale of a state's PET market, the fundamental structure of how that material flows to end-users also varies significantly by region. These structural differences are driven by the intensity of competition over feedstock and the relative maturity of local off-taker markets.

A comparison between the waste flow ecosystems in Kano and Anambra illustrate two distinct models:

PET waste flows (2025, MT): Kano vs. Anambra



In Kano, the value chain is characterized by high competition and a diverse range of off-takers. It serves as a PET hub for northern Nigeria, with an extensive footprint of both exporters and recyclers operating on-the-ground through local collection centers. Because of this, collectors often bypass traditional aggregation entirely, establishing direct sales relationships with recyclers to secure better prices. Nearly 50% of the collected volume in Kano is sold directly to exporters.

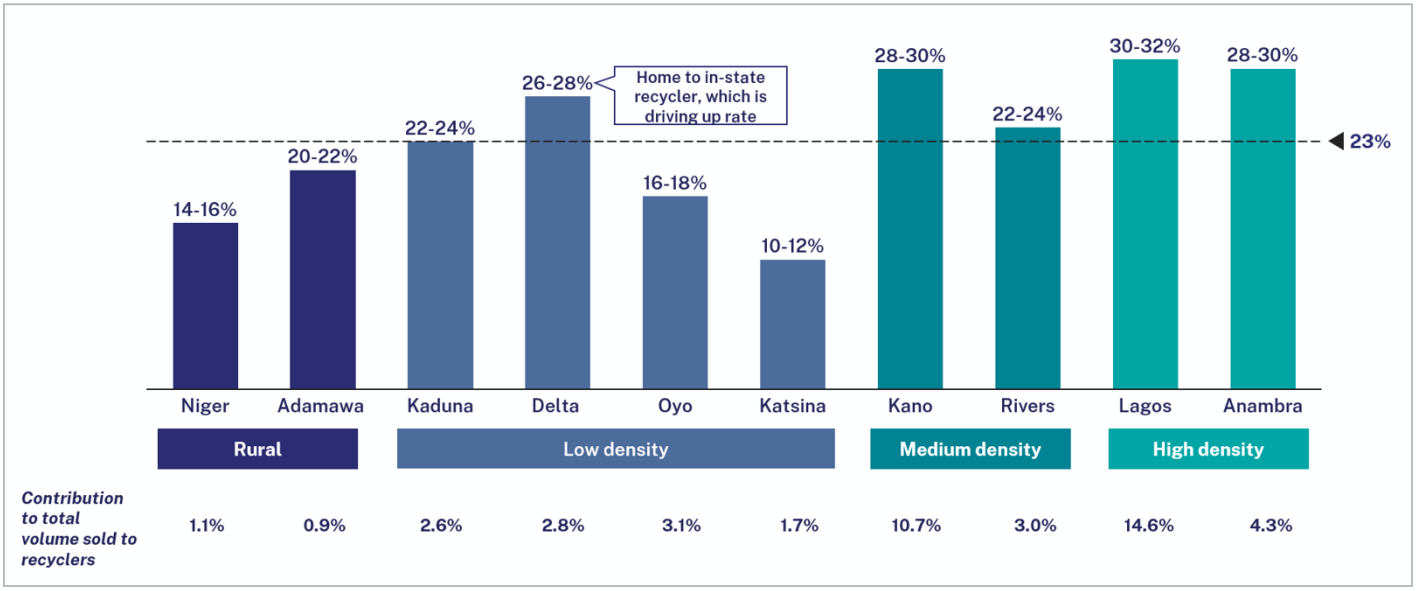
In contrast, Anambra relies on a consolidated aggregator network that serves as the primary gateway for the state's collected PET. In this model, collectors sell 75% of their volumes directly to aggregators, who then consolidate the material for sale to recyclers and exporters.

These divergent systems demonstrate that boosting domestic recycling rates requires more than just increasing total volumes collected; it demands implementing tailored strategies that address the specific collector-aggregator dynamics that define each state's unique waste flow.

Recycling rates

The study quantified recycling rates across the ten deep-dive states to understand how much of the PET waste generated in each state reaches local processing facilities. While the national average recycling rate is estimated to be 20-25%, performance in the deep-dive states ranges from 10-30%:

PET recycling rate by deep-dive state

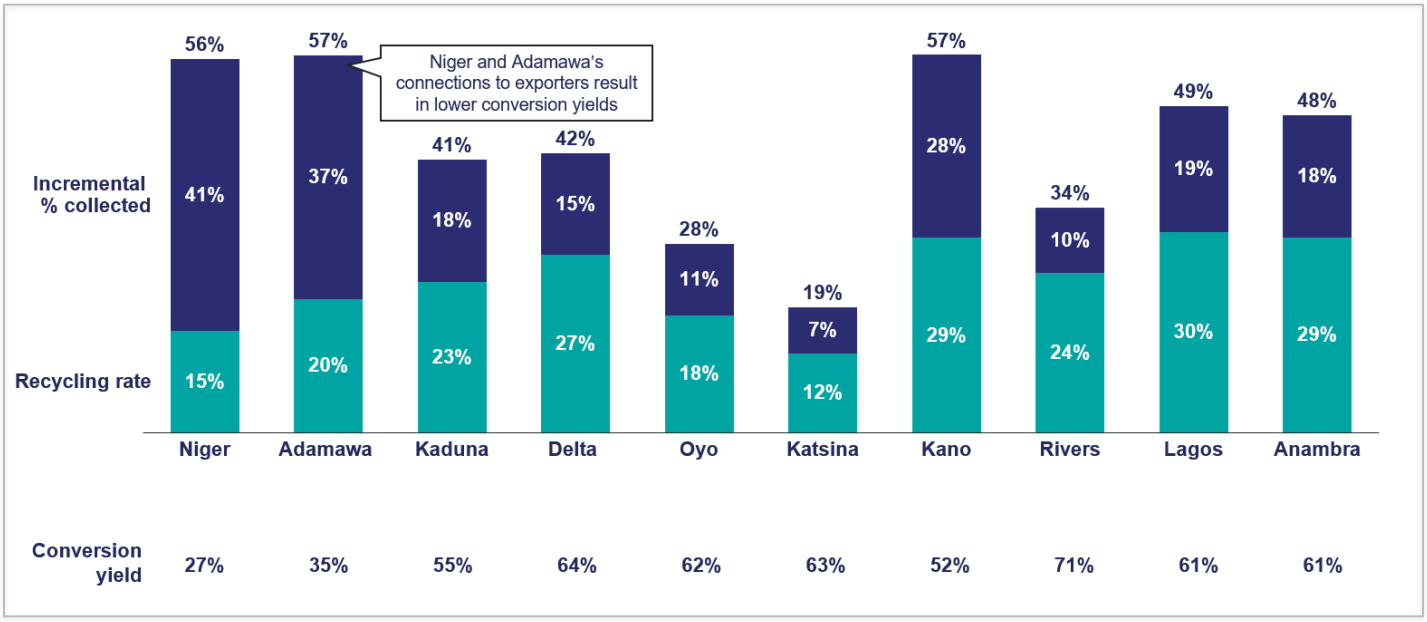


These findings indicate that a substantial portion of the volumes collected are either lost to leakage along the value chain or diverted to the international export market rather than processed locally.

A primary determinant of a state's recycling rate is its proximity to a recycling facility. States with large-scale local recyclers or established collection hubs typically outperform those without. For instance, Lagos has the highest recycling rate in the deep-dive group (30-32%), bolstered by strong collection and an in-state facility. Similarly, Kano and Anambra achieve comparably high recycling rates, benefitting from their roles as industrial hubs with direct access to domestic recyclers or, in the case of Kano state, three in-state collection hubs managed by recyclers. Interestingly, while Oyo has an in-state recycling facility, its recycling rate is at the lower end of the group (16-18%). Interviews suggest this is driven by the smaller scale of local aggregators and the in-state recycler's limited capacity.

Beyond proximity, the study identified a "conversion gap" in select states where high collection does not translate into high recycling rates:

Conversion Yields: Collection and recycling rates as % of total waste generated



Conversion yield calculated as recycling rate/total collected

Adamawa and Niger, for example, have high collection rates (55-60%) yet their domestic recycling rates are below average (20-22% and 14-16%, respectively). These states have strong connections to international exporters, resulting in the majority of their collected volumes being diverted abroad. On the other hand, Rivers has the highest conversion yield, with 71% of all PET collected within the state being recycled domestically. This efficiency is driven by proximity to numerous regional recyclers including Solid Chemical Resources in Delta, Zec Industries in Anambra, and Starich in Abia.

THE CONVERSION GAP

Definition: The difference between a state's collection rate and its domestic recycling rate – the share of PET collected and exported, rather than processed in Nigeria.

Where it is widest: Adamawa (~37% gap) and Niger (~41% gap). Both states have strong export-market pull and limited proximity to domestic recyclers.

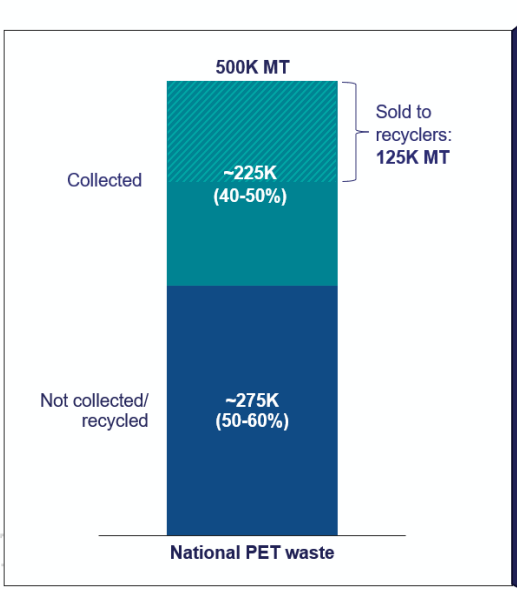
Why it matters: Closing the conversion gap is a high-leverage opportunity for the value chain. Each percentage point retained from export markets translates directly into domestic value addition, jobs, and feedstock for Nigerian recyclers.

National Findings

To establish a reliable national estimate for collection and recycling rates, the study extrapolated the granular data from the ten deep-dive states to the national level. This approach enabled a comprehensive quantification of collection and recycling rates across all 36 states and the Federal Capital Territory (FCT).

The national extrapolation analysis determined that of the 500K MT of PET waste generated annually, 40-50% is collected and 20-25% is recycled domestically.

National PET waste generation, collection, and recycling volumes (Annual, MT)



Sold to recyclers

- Recycling rates range from 8% (e.g., Borno, Yobe) to 30% (e.g., Lagos, Ogun)
  - Proximity to MRFs boosts recycling rates, whereas high exporter concentration reduces them
- Recent investment in domestic capacity could raise recycling collection rates from 25% to 35% in 2026, assuming full utilization

Collected

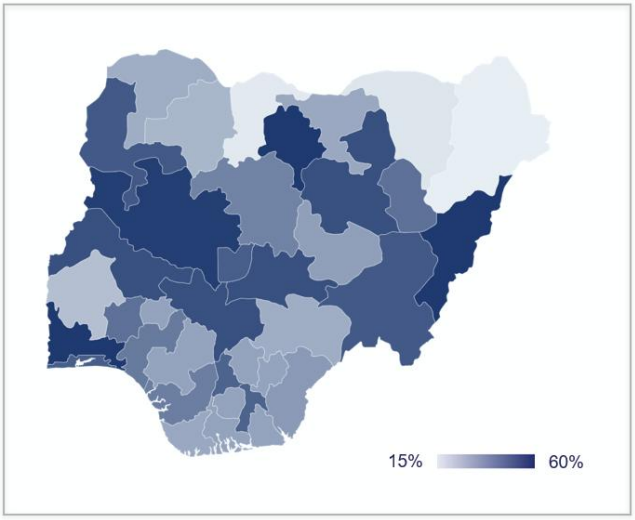
- Collection rates range from ~18% (e.g., Katsina, Borno) to ~60% (e.g., Kano, Adamawa), driven by collector availability and proximity to hubs; conflict-affected areas experience lower collection performance
- Collection remains below leading African markets, averaging ~45% in Nigeria vs. ~64% in South Africa

Not collected/ recycled

- Nigeria generates ~500K MT of PET waste annually
- ~40% of total PET waste is generated in just six states: Lagos, Kano, Rivers, Oyo, Katsina, and Anambra
- PET ecosystem players (e.g., MRFs, bottlers, FBRA) are expanding collection hubs nationwide, expected to reduce uncollected PET

Collection Rates

Rural and high-density states had higher average collection rates (51% and 49%, respectively) while low-and medium-density states had lower rates (35% and 34%, respectively).



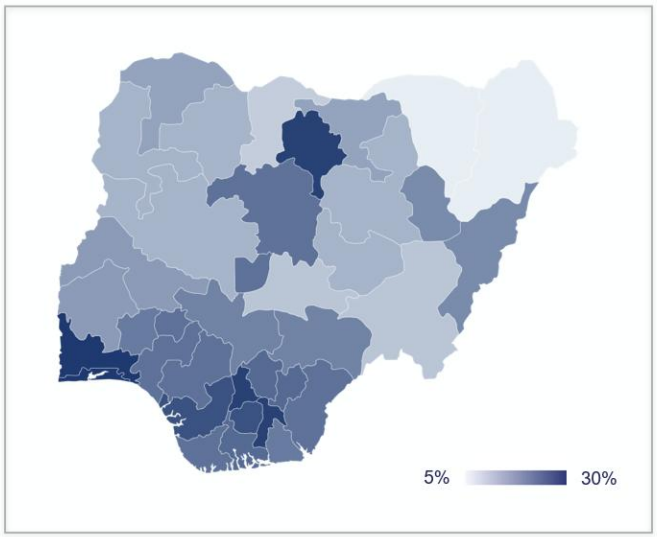
The study identified several systemic factors that dictate collection outcomes across the country:

- **Labor market dynamics:** A lack of formal job opportunities fuels waste collection by expanding the informal workforce, particularly in states where aggregator and exporter networks are robust.
- **Geographic and social barriers:** Collection is lowest in the northern states that are far from collection hubs or have underlying socio-demographic challenges that disincentivize collection, such as insecurity.

- **Off-taker infrastructure:** Collection is highest in states with established collection hubs or recyclers (e.g., southern states) or with strong export networks (e.g., Kano, Niger)

Recycling rates

In terms of recycling, the high-density states had the highest average recycling rate at 30%, versus only 15% for the rural states.

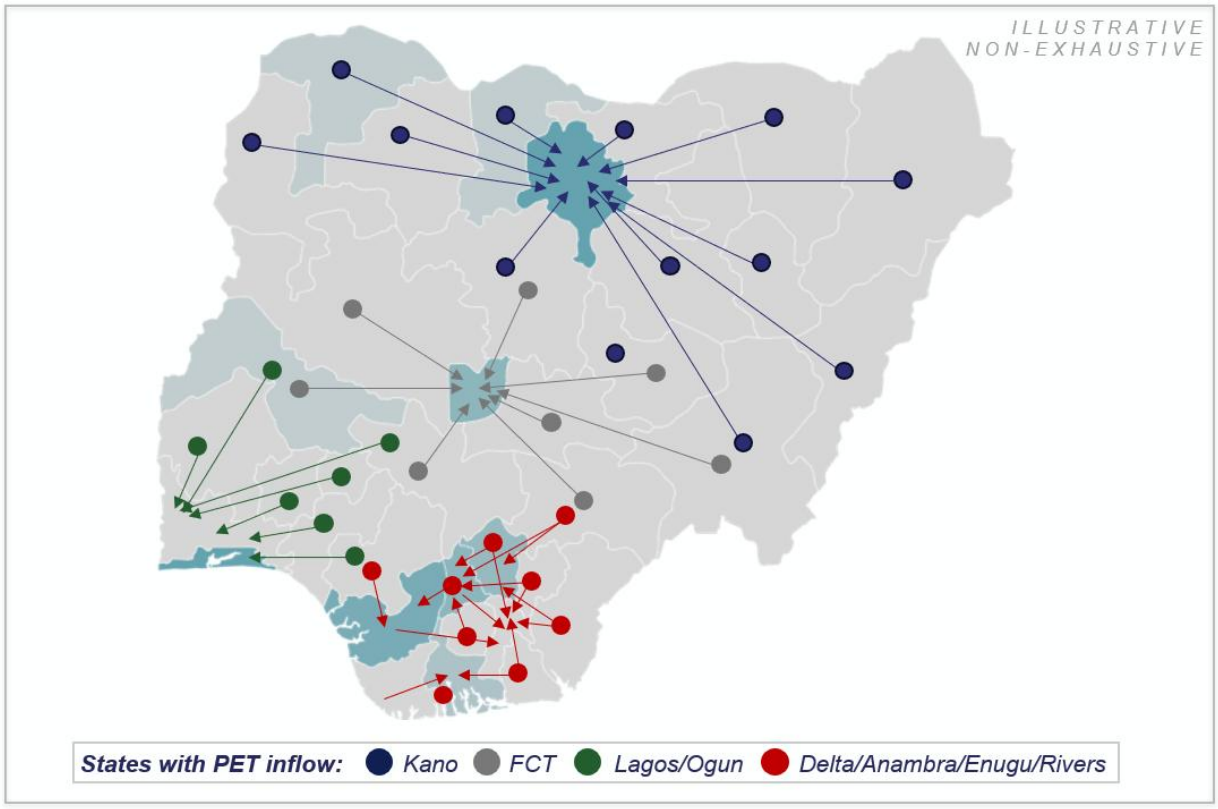


The high recycling rates in specific regions are the result of a coordinated movement of PET materials across state lines. Southern states have the highest recycling rates as most recyclers are located there and states are typically more urbanized. Lagos and Ogun states have the highest recycling rates in the nation, with the former home to three recycler-run collection hubs and the latter to three in-state recycling facilities. Kano is also a leading recycler, serving as an important aggregation center for northern Nigeria.

In general, recycling rates tend to decline with distance to recyclers, with significantly lower rates observed in the North East, North West, and North Central zones. This relationship between regional infrastructure and material recovery is best understood by examining the specific geographic corridors that funnel PET waste from decentralized points of collection toward four primary industrial hotspots.

Waste flows

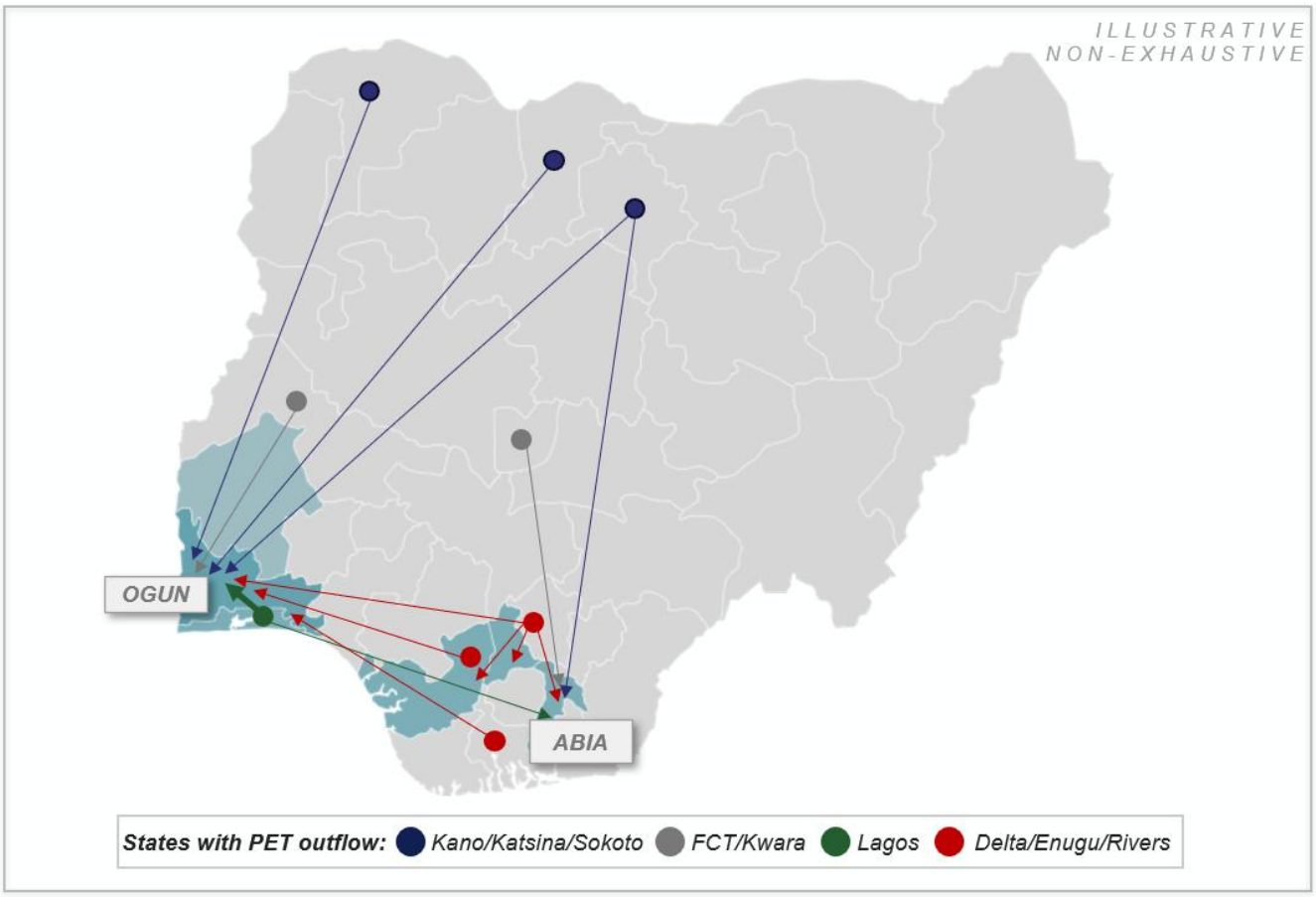
Nigeria Map: PET waste flows to collection hubs



Nationally, PET waste flows are concentrated in four collection hotspots: Kano, FCT, Lagos/Ogun, and Delta/Anambra/Enugu/Rivers.

- **Kano:** Waste is aggregated in Kano, which sources volume primarily from North East and North West zones. The state is home to three recycler-owned collection hubs, operated by Polysmart, Starich, and Alef.
- **FCT:** Abuja serves as the critical node for the North Central zone. It hosts one dedicated recycler-operated collection hub.
- **Lagos/Ogun:** Driven by extreme population density and the nation's most expansive network of informal collectors, Lagos aggregates massive quantities of PET. It has three in-state recycler-operated collection hubs. Significant volumes of PET also flow north into neighboring Ogun.
- **Delta/Anambra/Enugu/Rivers:** This region features a cluster of aggregation nodes across four different states. While individual collection volumes in some oil-producing states are lower, the region is supported by four recycler-owned collection hubs that consolidate waste for the South-South and South-East

Nigeria Map: PET waste flows to recyclers

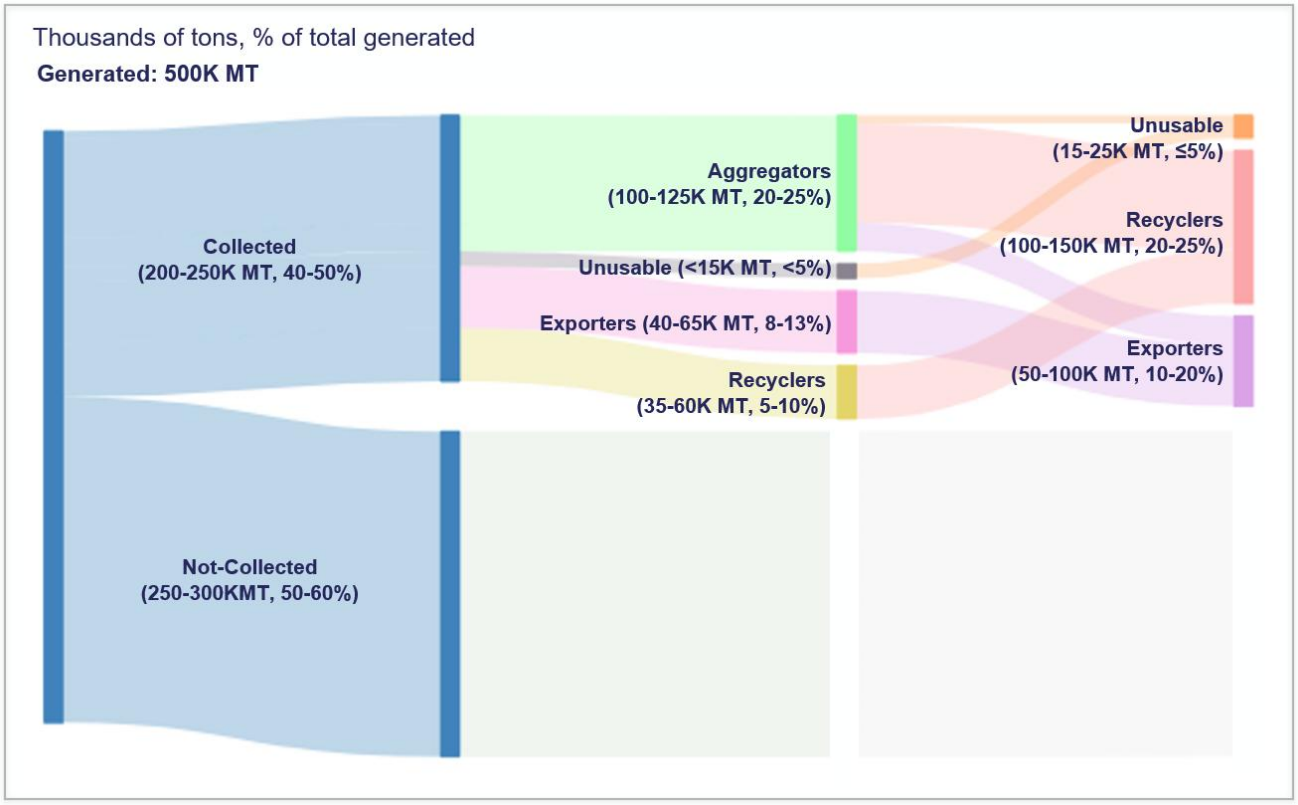


While collection hotspots represent the primary points of material aggregation, the ultimate destination for domestically recycled PET waste is determined by the location of processing plants (recyclers). As processing infrastructure is heavily concentrated in the south of the country, material flows primarily in this direction. There are two key recycling hotspots:

- **Ogun/Lagos:** Ogun, which is home to three recyclers – two food-grade and one non-food-grade – has emerged as the nation's primary recycling powerhouse. It serves as a destination for PET flowing from northern and central states. Outside of Ogun, the area is also home to recycling facilities in Lagos (Sonnex) and Oyo (OM).
- **Abia/Delta/Anambra:** PET flows to numerous recycling locations in this area, including Anambra (Zec) and Delta (Solid Chemicals). Both of these recyclers produce non-food-grade PET. Notably, this region is home to Starich in Abia, which currently operates as the highest-capacity recycler in the country.

Although national domestic recycling capacity is gaining traction, the national waste flow reveals a critical gap between material recovery and local value addition. Currently up to ~40% of collected waste is exported – much of it as low-value feedstock – limiting the value addition captured within the country. Furthermore, the 40-50% national collection rate indicates that the majority of PET waste is processed sub optimally, highlighting an opportunity to scale recovery efforts and strengthen Nigeria's circular economy.

PET Waste Flow in Nigeria, 2025



3.0 Interventions for systems change

The following targeted interventions offer a significant opportunity to elevate Nigeria's collection and recycling rates while fostering dignified work across the value chain. By addressing the systemic barriers and challenging operational conditions identified in this study, these recommendations provide a roadmap for an inclusive circular economy.

The recommendations are structured to empower actors at every level of the value chain, from collectors to recyclers. To ensure actionability, interventions have been grouped by owner. This clear ownership structure aims to facilitate easy engagement, allowing stakeholders to identify exactly where their expertise and resources can drive the most impact.

Government interventions

Governmental bodies, such as the Federal Ministry of Environment and NESREA, provide the regulatory and implementation frameworks necessary to stabilize the PET value chain. These actions focus on codifying national recycling standards through legislation and enforcement.

Category	Intervention
Policy and legislation	• Ensure NESREA has adequate budget to enforce the *National Environmental (Plastic Waste Control) Regulations*
	• Analyze domestic rPET processing capacity, revising regulations as needed; subsequently, enforce rPET thresholds
Infrastructure	• Invest in infrastructure (e.g., roads) and resolving operational challenges (e.g., issues with road safety officials, vehicle permits, etc.) that hinder collection and aggregation efforts
	• Allocate adequate resources to bolster formal collection and recycling efforts
Market development	• Support FBRA's efforts to formalize the collection sector (e.g., by offering government-recognized collector identification cards)
Advocacy	• Promote collaboration between collector cooperatives and local governments/waste management authorities to increase sector legitimacy and improve collection access
	• Launch national campaign to raise community awareness of recycling and the important roles that collectors/aggregators play for society

Private sector interventions

The private sector has the opportunity to drive change through infrastructure investment and generating market demand for rPET. These interventions are focused on stabilizing the value chain and fostering the long-term commercial viability of the PET sector.

Category	Intervention
Policy	• Champion adoption of the *Plastic Waste Control Regulations,* which were passed in April 2026
Equipment	• Sponsor the adoption of essential tools and machinery (e.g., balers, industrial scales) at the aggregator-level via a lease-to-own model
Logistics	• Foster entrepreneurs and/or provide start-up capital to develop additional collection hubs to act as "feeders" to recyclers
Economic & Structural	• Formalize off-taker agreements with recyclers, specifying volumes/quality requirements to encourage investment and capacity expansion
	• Formally commit to rPET threshold minimums (including those that exceed regulatory requirements)
Financing	• Partner or invest in SMEs operating in the green energy space to boost solar adoption at aggregation facilities
	• Partner or invest in SMEs developing innovative finance tools to increase bankability, such as digital wallets that use daily collection volumes as collateral for microloans

Donors

Donors can catalyze systemic change by supporting the collaborative networks and educational foundations required for a successful circular economy. These interventions focus on championing shared resource models, launching awareness initiatives, and providing the resources and insights needed to support the effective implementation of national policies.

Category	Intervention
Advocacy	• Support the establishment and formalization of collector cooperatives
	• Champion collaborative procurement initiatives that allow value chain actors to procure joint machinery
Public awareness	• Launch youth education campaigns to raise awareness about the importance of recycling, emphasizing school-based programming
Policy support	• Support implementation of Nigeria's EPR framework by sharing technical insights from more mature PRO markets with NESREA (e.g., approaches to calculating EPR fees, developing a functional plastic registry)
	• Sponsor study tours or knowledge-exchange programs between Nigerian regulators and successful circular economy hubs, such as PETCO in South Africa, to fast-track learning

FBRA interventions

The Food and Beverage Recycling Alliance is the primary Producer Responsibility Organization in Nigeria, representing the interests of the leading consumer goods companies. As a critical industry-led coordinator, FBRA's interventions focus on sector formalization and collective advocacy.

Category	Intervention
Market linkages	• Promote collective off-taker agreements for collectors and strengthen cooperatives
	• Fund an innovative PPE voucher program (in partnership with private sector players and/or Collector Associations)
Market development	• Leverage FBRA's network to garner government support and promote sector legitimacy; for example, by establishing state-backed collection centers on public land, where the government provides the space and the Alliance contributes technical infrastructure
	• Develop additional collection hubs (in partnership with private sector players and/or recyclers)
	• Formalize the sector by registering collectors and offering uniforms to improve with identification
Public awareness	• Launch consumer-facing campaigns to promote separation-at-source activities at the household and community level

Modernize equipment	• Fund a mobile maintenance task force to provide repair services for aggregators, especially in areas with a high-density of aggregators (e.g., Onitsha, Anambra)
Quality control	• Expand testing capacity and labs through investment in third-party lab facilities and capacity building to harmonize quality and minimize rejection rates
Systems replication	• Implement operational frameworks modeled after other successful PROs to maximize impact

Nonprofit interventions

Non-profit-led efforts focus on capacity building and technical training to ensure the value chain produces value in a safe and sustainable way for all participants.

Category	Intervention
Capacity building	• Conduct training for collectors on PET collection, handling, sorting, and cleaning techniques to improve safety and quality

	• Provide aggregators training on workflow optimization, financial tracking, record keeping, and investment decisions
	  ○ Improved documentation will improve bankability/ access to credit
	  ○ Sessions to offer information on environmental, health and safety risks

	• Engage recyclers in group workshops to cross-pollinate learnings (e.g., on operational efficiency improvements, increasing line utilization, etc.)
Market Development	• Cluster and formalize collectors into cooperatives to streamline knowledge exchange, foster community ties, and enhance bargaining power
Market Linkages	• Connect collectors with PPE, PPE providers, or partner organizations that can support gear distribution and co-financing

4.0 Conclusion and Call to Action

Market outlook

Nigeria's PET sector is at a critical inflection point, transitioning from an informal and fragmented ecosystem toward a high-potential industrialized model. The country generates 500K MT of PET waste annually, representing a massive reservoir of feedstock that remains largely untapped due to persistent systemic challenges, including fragmented collection, high operational costs, and weak policy enforcement. While the volume of generated PET is projected to proliferate as per-capita consumption of plastic grows at 3.6%[7] per annum, capturing the material remains complex. However, this growth offers a significant opportunity for sourcing local high-quality PET, often at discounts to virgin PET imports; this becomes more attractive as new regulations mandate recycled content thresholds.

The future for the sector is tied to its ability to move beyond fragmented recovery toward a formalized network supported by clear regulatory standards and modernized infrastructure. This transition is already gaining momentum through major investments, such as Polysmart's $60 million commitment[8] to build the nation's largest recycling facility. As recycling capacity expands, success will depend on a unified effort to formalize and scale collection and aggregation efforts to feed this emerging industrial off-take.

Two projection scenarios for 2030 anchor the urgency of the call to action:

- **Status quo (do nothing):** ~675K MT of PET waste generated; 350-400K MT uncollected; 65%+ mismanaged — assuming current collection (40–50%) and recycling (20–25%) rates persist against projected population expansion and a 3.6% per-capita plastic consumption growth rate

[7] Market Assessment for Plastics Circularity in Nigeria, PWC (2019)

[8] Polysmart Packaging Limited Announces $60 Million Investment, Poised to Launch Nigeria's Largest Plastic Recycling Plant (2026)

- **Coordinated action:** Incremental ~100K MT of PET recovered annually over baseline; 5-15% income increase for collectors — if the priority interventions outlined in Section 3 are implemented in coordination across owners.

Call to action

To transform Nigeria's PET waste burden into a resilient circular economy, stakeholders must move beyond independent, small-scale pilots and commit to a coordinated, systems-level strategy:

Non-profits

Should focus on capacity building and upskilling workers along the value chain to work safely and efficiently. Supporting the professionalization of aggregator networks will be essential to ensure these players are bankable and capable of scaling alongside recyclers.

The government

Should prioritize the consistent enforcement of the Plastic Waste Control Regulations. It should also leverage the National Guidelines for *the EPR Programme* to ensure successful operationalization. Mandatory enforcement of the EPR will signal to investors that Nigeria is a stable, regulated environment, de-risking the infrastructure investments required for sector growth.

Private Sector

Must formalize long-term off-take agreements with recyclers and commit to mandatory rPET threshold minimums. These commitments are the primary levers required to provide the financial certainty for the capacity expansions that will anchor the value chain.

FBRA

Must serve as the institutional bridge between the private ad public sectors, leading efforts to legitimize the recovery workforce. By strengthening cooperatives and advocating for inclusive waste management systems, the Alliance can

ensure work is dignified and off-takers have reliable access to high-quality feedstock.

The Opportunity for Systemic Change is Immense

- Its success depends on a unified commitment from all stakeholders to move beyond isolated efforts and toward true collective action.
- By dismantling existing hurdles, Nigeria can channel its current waste burden into a structured domestic value chain.
- This transition will not only create a cleaner environment and support dignified livelihoods but will anchor a resilient, waste-to-wealth economy that serves as a model for sustainable growth.

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Appendix

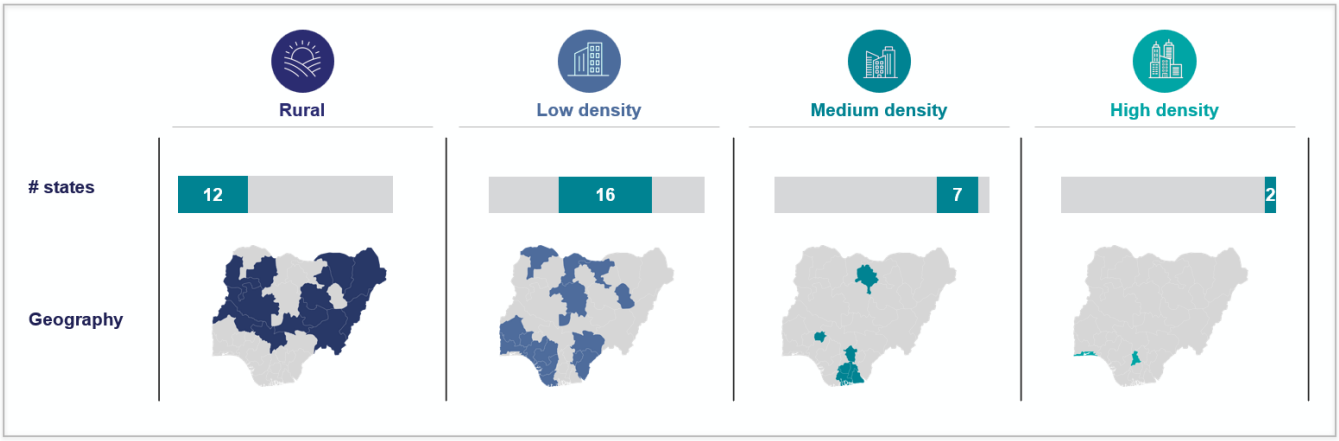
Glossary

Bales	Compressed bundles of PET bottles, often sorted by color and quality. Typically sold to recyclers or exporters.
EPR	Extended Producer Responsibility
FBRA	Food and Beverage Recycling Alliance; serves as a PRO focused on sustainability and the recovery of post-consumer packaging waste
Flakes	Shredded washed or unwashed PET, generally 12–14mm in size. Typically sold to recyclers or exporters.
Loose bottles	Post-consumer PET bottles collected in landfills, hotels, event spaces, households, etc. Typically sold to aggregators, recyclers, or exporters.
MT	Metric Tons
NESREA	National Environmental Standards and Regulations Enforcement Agency
PCR	Post-consumer recycled resin
PPE	Personal protective equipment
rPET	Recycled PET
rPET resin	Highly-processed, decontaminated PET pellets that meet strict food-grade standards. Typically sold to food-grade manufacturing companies (e.g., bottle-to-bottle producers).
PET	Polyethylene Terephthalate
PRO	Producer Responsibility Organization
vPET	Virgin PET

Methodology details

After quantifying collection and recycling rates in the ten deep-dive states, the study team worked to extrapolate the findings to the national level. To do so, the team combined regression modelling with qualitative refinements to account for state-level differences, ultimately estimating a collection and recycling rate for each state. An overview of the four-step analytical approach is outlined below:

Step 1) Archetype grouping: Initially, all 36 states and the Federal Capital Territory were categorized into four archetypes based on population density. This metric served as the primary variable in archetype definition due to its positive correlation with PET waste generation. The four state archetypes – rural, low density, medium density, and high density – each represent a distinct waste system regime.



Step 2) Collection rate modelling: Baseline collection rates were established by calculating the mean performance of deep-dive states within each archetype. This provided a representative anchor for the remaining states in the archetype. For example, in the "rural" archetype, the average collection rate for the two observed deep-dive states in the cohort, Adamawa and Niger, were 57% and 56%, respectively. Therefore, these values served as the baseline collections rate for the other states within the "rural" cohort. This initial estimate was subsequently refined (+/- 5%) based on state-level unemployment rates, reflecting the impact of informal labor supply on recovery volumes.

Step 3) Recycling rate modelling: This analysis mirrored the collection-rate approach; states across archetypes were assigned an initial recycling rate based on the observed values from deep-dive states. Then, GDP/capita was used as a proxy variable for further adjustments, as this

metric effectively captures the relationship between domestic recycling outcomes, capital availability, and access to downstream markets. Estimated recycling rates were then updated to account for this variable on a state-level.

Step 4) Qualitative adjustments: After estimating state-level collection and recycling rates based on the deep-dive state data and relevant regressions, the final phase involved making targeted adjustments to capture socioeconomic factors that the regression models could not capture. These refinements included:

- Collection adjustments:
  - Presence of exporters or proximity to collection / aggregation hubs
  - Security and risk levels
  - Oil-producing states with structurally high unemployment
  - Presence of non-PET recyclers (e.g., metal recyclers)
- Recycling adjustments:
  - In-state presence of recycling facilities or collection hubs
  - Proximity to states with recycling facilities or recycling-managed hubs

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State-level estimates

Collection rate by state

Archetype	State	Deep dive state	PET waste (K MT)	Collection rate (%)
Rural	Niger	✓	10	56%
	Adamawa	✓	7	57%
	Borno		9	18%
	Yobe		5	20%
	Taraba		4	50%
	Zamfara		9	30%
	Plateau		8	35%
	Kwara		5	52%
	Kebbi		9	50%
	Bauchi		13	52%
	Nasarawa		4	52%
	Kogi		8	52%
Low Density	Katsina	✓	21	19%
	Oyo	✓	18	28%
	Kaduna	✓	17	41%
	Delta	✓	12	42%
	Jigawa		15	33%
	Osun		12	45%
	Sokoto		11	32%
	Benue		11	32%
	Bayelsa		5	33%
	Gombe		7	45%
	Ebonyi		8	34%
	Edo		9	34%
	Ondo		11	43%
	Cross River		8	36%
	FCT		9	49%
	Ogun		14	57%

Archetype	State	Deep dive state	PET waste (K MT)	Collection rate (%)
Medium Density	Rivers	✓	22	34%
	Kano	✓	43	57%
	Ekiti		9	34%
	Akwa Ibom		16	34%
	Enugu		12	34%
	Imo		18	34%
	Abia		11	48%
High Density	Anambra	✓	19	48%
	Lagos	✓	70	49%
National value			500K MT	~40-50%

Lowest	Low	Medium	High	Highest

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Recycling rate by state

Archetype	State	Deep dive state	PET waste (K MT)	Recycling rate (%)
Rural	Niger	✓	10	15%
	Adamawa	✓	7	20%
	Borno		9	8%
	Yobe		5	8%
	Taraba		4	13%
	Zamfara		9	15%
	Plateau		8	15%
	Kwara		5	18%
	Kebbi		9	15%
	Bauchi		13	15%
	Nasarawa		4	13%
	Kogi		8	21%
Low Density	Katsina	✓	21	12%
	Oyo	✓	18	18%
	Kaduna	✓	17	23%
	Delta	✓	12	27%
	Jigawa		15	17%
	Osun		12	22%
	Sokoto		11	17%
	Benue		11	21%
	Bayelsa		5	23%
	Gombe		7	20%
	Ebonyi		8	24%
	Edo		9	23%
	Ondo		11	23%
	Cross River		8	23%
	FCT		9	23%
	Ogun		14	30%

Archetype	State	Deep dive state	PET waste (K MT)	Recycling rate (%)
Medium Density	Rivers	✓	22	24%
	Kano	✓	43	29%
	Ekiti		9	23%
	Akwa Ibom		16	22%
	Enugu		12	24%
	Imo		18	27%
	Abia		11	29%
High Density	Anambra	✓	19	29%
	Lagos	✓	70	30%
National value			500K MT	~20-25%

Lowest	Low	Medium	High	Highest

Domestic PET recycling facilities

The following table catalogues the ~10 recyclers currently operating in Nigeria. Food-grade designations should be verified with operators.

Facility	State	Recycler Type
Alef Recycling	Ogun	Food-grade
Lexsz	Ogun	Non-food-grade
Om Waste Recycling	Oyo	Non-food-grade
Polysmart	Ogun	Food-grade
Solid Chemicals	Delta	Non-food-grade
Sonnex	Lagos	Food-grade
Starich	Abia	Non-food-grade
Zec Industrials	Anambra	Non-food-grade

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