

POLICY PAPER

In the Loop: Localized Circular Economy in Practice

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Executive Summary

The Philippines produces more plastic waste each year than its collection and recycling systems can absorb, and the gap between the two is widening rather than closing. The country already has the legal architecture to deal with this. Republic Act 9003 assigns local governments responsibility for segregating waste at source and diverting it from landfill, while Republic Act 11898 makes large producers accountable for recovering the plastic packaging they place on the market. Read together, the two laws describe a functioning circular economy, one in which materials are kept in use rather than discarded and in which the cost of recovery falls partly on those who profit from putting the material into circulation.

The problem is not the absence of policy. It is the distance between what the statutes require and what is happening in barangays, municipal halls, and corporate compliance offices. Recovery obligations under the EPR law climb to 80 percent of plastic packaging footprint by 2028, but reporting from obligated enterprises is inconsistent and difficult to verify, a significant share of barangay materials recovery facilities exist on paper without functioning as sorting operations, electronic waste has almost no dedicated infrastructure anywhere in the country, and the informal collectors who perform much of the recovery work that formal figures take credit for remain outside the system entirely, without protection, fair pricing, or recognition.

This paper draws on three localities that have made measurable progress under the same national framework that others have struggled with, namely San Fernando in Pampanga, Barcelona in Sorsogon, and Lopez in Quezon, together with the discussion at the Liveable Cities Co+Lab roundtable on circular economy. Their experience suggests that the binding constraint is rarely legal authority. It is enforcement capacity, financing, data, and political will at the local level. On that basis the paper makes five recommendations:

- Enforce the law that already exists. Apply "no segregation, no collection" without exemption, require Waste Analysis and Characterization Studies on a fixed cycle so that planning rests on real data, and activate the independent third-party audits that RA 11898 already provides for, but which are not yet operating at scale.
- Balance penalties with incentives. Performance-based grants to barangays, local tax relief for businesses that redesign packaging, and buy-back schemes for households change behavior more durably than fines alone, and they cost

less to administer than enforcement actions that local governments are often reluctant to pursue against their own constituents.

- Bring the informal waste sector inside the system. Registration, cooperative formation, protective equipment, and guaranteed offtake at fair prices would formalize a workforce that is already doing the work, and would give producer responsibility organizations a verified collection base they currently lack.
- Build electronic waste capacity before the problem compounds. Designate facilities capable of handling special wastes, require manufacturers and retailers to operate accessible take-back points under the EPR framework, and route collected material to DENR-accredited treatment facilities.
- Recalibrate targets against measured capacity. Use audit results to test whether the 2028 target is achievable across all material streams, set material-specific timelines that acknowledge sachets are harder to recover than rigid containers, and stagger deadlines for municipalities that lack the fiscal base of a highly urbanized city.

Context: Plastic Waste and Climate Risk

The Philippines again ranked highest in the 2025 World Risk Report, and the ranking measures more than geographic exposure to typhoons, earthquakes, and sea level rise. It combines that exposure with vulnerability, which is a function of infrastructure quality, institutional capacity, and the ability of households to absorb and recover from shocks. A country can do little about where it sits on the Pacific Ring of Fire. It can do a great deal about the second half of that equation, and waste management sits squarely within it. Blocked drainage canals turn ordinary monsoon rain into urban flooding. Uncollected residual waste in coastal barangays becomes marine debris within a single storm surge. Open dumps leach into groundwater and burn during dry months. These are not separate problems from climate risk. They are the mechanism through which climate hazards become disasters.

A circular economy addresses this from a different direction than conventional waste management does. The prevailing model is linear, running from extraction to manufacture to consumption to disposal, and it treats the final step as the end of the producer's involvement and the beginning of the public's expense. Circularity reverses that logic by designing for reuse, repair, refurbishment, and recycling so that materials re-enter production rather than accumulating in landfills, waterways, and coastal zones. The economic case is as strong as the environmental one. Every tonne of material recovered and returned to manufacturing displaces a ton of imported virgin material, and every functioning recovery chain supports livelihoods that do not currently appear in local economic accounts.

For the Philippines this makes circularity a resilience strategy rather than an environment programmed in isolation. It reduces the volume of material that clogs drainage and washes into the sea, it lowers the fiscal burden of hauling and tipping fees that consume a substantial share of municipal budgets, and it builds local economic activity around materials that are currently treated as a cost. Almost all of that work has to be done by local governments, in cooperation with producers and with the people

The Policy Framework: RA 9003 and RA 11898

Two statutes carry most of the weight in Philippine circular economy policy. The first governs the public sector and the physical management of waste, the second governs producers and the material they place on the market. They were enacted twenty-two years apart and they operate on different logics, which is both their strength and the source of some of the friction in implementation.

Republic Act 9003: Ecological Solid Waste Management Act of 2000

RA 9003 established a national program for the systematic management of solid waste, with public health and environmental protection as its stated priorities. It created the National Solid Waste Management Commission under the Office of the President to oversee implementation across agencies, and the National Ecology Center to provide the technical support and training that local governments would need to comply. The institutional design assumed that the main obstacle would be technical knowledge rather than money or enforcement, an assumption that has proven only partly correct.

The operational requirements are specific and, on paper, demanding. Waste must be segregated at source rather than sorted after collection. Every barangay, or cluster of barangays where scale makes that more practical, must operate a materials recovery facility to sort and process what is collected. Open dumps are prohibited outright and were required to be converted or closed in favour of sanitary landfills meeting defined engineering and environmental standards. More than two decades after enactment, compliance with the landfill provisions remains incomplete in many provinces, and the number of materials recovery facilities that are genuinely operational is considerably lower than the number that have been established.

Republic Act 11898: Extended Producer Responsibility Act of 2022

RA 11898 amends RA 9003 and introduces a principle that the older law did not contain, namely that responsibility for a product does not end at the point of sale. It defines extended producer responsibility as an approach holding producers accountable for the post-consumer stage of what they sell, which shifts part of the cost of recovery from local governments and households onto the enterprises that benefit from placing the packaging in the market in the first place.

The obligation applies to large enterprises, defined as those with total assets exceeding PHP 100 million. Those firms must establish and operate programs for managing their plastic packaging waste, covering sachets, rigid containers, and single-use bags, and they may do so individually or collectively through a producer responsibility organisation. All such programs must be registered with the National Solid Waste Management Commission, which gives the state a register against which compliance can in principle be measured.

Recovery obligations escalate on a fixed schedule. They began at 20 percent of plastic packaging footprint by 31 December 2023 and rose annually to 80 percent by 2028, with that level maintained every year thereafter. The schedule was set without a national baseline of recovery infrastructure capacity, which is the central difficulty examined later in this paper. A target that outruns the physical ability to collect, sort, and process material does not drive investment so much as it drives creative reporting.

Mandates of Local Government Units

Local governments do the operational work that the national framework depends on. Under RA 9003 they must prepare ten-year solid waste management plans organised around diversion through reuse, recycling, and composting, and those plans are meant to be living instruments rather than compliance documents filed once and forgotten. Responsibility is divided by tier. Barangays handle segregation and collection of biodegradable and reusable material, which is the fraction where diversion gains are largest and cheapest. Cities and municipalities handle non-recyclable residuals and special wastes, which are the fractions requiring capital investment and technical capacity that most barangays do not possess.

The law also equips local governments with enforcement powers that are frequently underused. Littering and open burning are prohibited acts, and local governments may impose administrative sanctions and pursue criminal penalties. In practice, enforcement against residents is politically costly and enforcement against commercial establishments requires inspection capacity that many municipalities

have not staffed. The result is that the sanctions exist as a deterrent on paper while the actual behaviour change depends almost entirely on persuasion and convenience.

RA 11898 adds a second dimension to the local role. The national framework for product waste recovery must include partnerships with local governments, communities, and the informal waste sector, and those partnerships are intended to prevent leakage into the environment by tying ground-level collection into the recovery obligations of large producers. This is a significant change in the incentive structure. Where RA 9003 gave local governments a duty funded from their own revenues, RA 11898 gives them a counterpart with a compliance deadline, a budget, and a reason to seek them out. The combination is what has the potential to turn a statutory obligation into a financially sustainable system, provided the partnerships are structured so that value flows to the localities doing the collection rather than only to the intermediaries.

Local Implementation: City of San Fernando, Barcelona, and Lopez

The following three localities operate under exactly the same national framework as every other Philippine city and municipality. Their results differ sharply from the national average, which is the most useful evidence available about what actually determines success.

City of San Fernando, Pampanga

San Fernando is one of only two Philippine cities named by the United Nations among twenty city leaders working towards zero waste. By 2018 the city had reached a diversion rate of 80 percent, meaning that only a fifth of the waste it generated reached landfill. That figure is comparable to high-performing cities in far wealthier countries, and it was achieved without correspondingly higher spending.

The system was designed with the Mother Earth Foundation around a principle that separates it from most local programmes, which is that the intervention point is source reduction rather than disposal management. Households and establishments segregate before collection rather than relying on downstream sorting, which is both cheaper and produces cleaner material streams with higher resale value. The city supports this with consistent enforcement of local ordinances, including a "*no segregation, no collection*" rule that is actually applied, a ban on single-use plastic bags, and mandatory composting of organic waste. The enforcement point matters more than the ordinances themselves.

Many localities have passed similar rules; San Fernando is distinguished by having enforced them long enough for compliance to become habitual.

Municipality of Barcelona, Sorsogon

Barcelona took a different route, treating waste as an input to local enterprise rather than primarily as a disposal problem. Through accessible community workshops, residents convert discards and plastic waste into products with a genuine market. Bar soaps are made with dried flowers native to the municipality, artisanal items are carved from sun-dried coconut shells, and local vinegar is fermented from collected coconut water that would otherwise be discarded during processing. All of these products have now become part of Barcelona's identity.

The municipality also launched a buy-back scheme in 2021 that has sustained both community participation and collection volumes over several years, which is unusual for programmes of this kind. Under the *Plastik Palit Pera*, or 3Ps Program, residuals are recovered and repurposed rather than dumped. The design closes the material loop and creates household income at the same time, and the income is what explains the durability of participation. Programs that rely on environmental motivation alone tend to decay once the launch enthusiasm fades; programs that pay do not.

Municipality of Lopez, Quezon

Lopez demonstrates what institutional structure contributes. It is among the stronger local implementers of RA 9003, and its Municipal Waste Management Board handles compliance and monitoring as a standing function rather than an occasional exercise. Municipal Resolution No. 2009-040 commits every barangay in the municipality to proper waste management, which converts a municipal policy into an obligation at the level where collection happens.

Residents are required to segregate at source and to follow published collection schedules, and they are informed clearly and in advance about the penalties for non-compliance. That last element is easy to overlook but it is what makes enforcement defensible. A penalty regime that residents understand before it is applied generates far less resistance than one that appears to arrive arbitrarily, and it substantially reduces the political cost to local officials of enforcing it.

Across all three cases the determining variable is the same. Circularity works where local leadership is sustained, where enforcement is consistent enough to shift habits, and where participation carries either an economic return or a clearly

communicated consequences. Where those conditions are absent, the national framework produces documentation rather than diversion.

Producer Responsibility in Practice

Local governments handle collection, but the model cannot close without producers. The shift from RA 9003 to RA 11898 moved a portion of the responsibility upstream, so that large enterprises must now account for the full life of what they sell rather than only for what happens inside their factories. The combination of local logistics on one side and producer-funded recovery of high-value material on the other is what distinguishes a circular economy from conventional waste management, which simply moves material from where people live to where they do not.

Ivanna Aguilung-Dela Torre, Founder of KayaROI and Chief Curator at HERDD, argues that behaviour has to be designed for rather than assumed. Bin colors should be standardized nationally, blue for recycling and green for composting, and paired with icons and labels legible at a glance to someone who is not paying close attention, which describes almost everyone disposing of waste. Iconography should be uniform across localities so that a person who learns the system in one city does not have to relearn it in another. Labels should use verbs rather than nouns, so *"recycling"* rather than *"recyclable"*, because the verb tells the person what happens next while the noun merely classifies the object. Her broader point is that circularity fails when it is treated as a downstream problem. Interventions have to run across the whole chain, upstream in product and packaging design, midstream in distribution and consumption, and downstream in collection and processing, because a material designed to be unrecoverable will not become recoverable through better bins.

Engr. Ceidge Razon, Chief Sustainability Officer at Basic Environmental Systems and Technologies, Inc., locates the working part of the system in communities. Barangay clean-ups, recovery drives, community composting, and buy-back campaigns are what keep material moving through the chain, and no amount of corporate commitment substitutes for that ground-level activity. He also makes the case for data as a precondition rather than an afterthought. Waste Analysis and Characterization Studies (WACS) conducted by local governments and private collectors are what allow a city to match its actual waste volumes against the number of collection vehicles it operates and the type of processing facility it should be building. Without that evidence, infrastructure decisions are made on assumption, and the resulting facilities are routinely either underused or overwhelmed within a few years of commissioning.

Gaps in Current Implementation

There is genuine movement to report. RA 9003 and the EPR law have generated visible activity on both the public and private sides. The Department of Environment and Natural Resources has pushed enrolment of EPR programs, and regional Environmental Management Bureau consultations are tracking local government compliance in a more structured way than previously. Baseline assessments and measurement frameworks developed with UNDP and other partners now give cities and municipalities a means of tracking progress against something other than their own estimates, and pilot work on diversion at materials recovery facilities, producer registration, and recovery targets shows implementation spreading beyond the early adopters.

The shortfalls are equally clear, and they are structural rather than incidental. Reporting is inconsistent in both format and quality, which makes aggregation at the national level unreliable and makes it difficult to distinguish genuine recovery from paper compliance. Coverage is patchy across material streams, with electronic waste the most serious omission given its hazard profile and its growth rate. The informal sector, which performs a substantial share of actual recovery, remains outside the formal system, meaning its output is invisible in official figures while the people doing the work bear the health risks without protection or fair pricing. And full compliance with the escalating EPR recovery targets is not within reach on the current trajectory.

Taken together, this is a picture of proof of concept rather than proof of scale. The mechanisms work where they have been properly resourced and enforced. They have not been resourced and enforced widely enough, consistently enough, or long enough to change the national position. The recommendations that follow are directed at closing that gap rather than at redesigning a framework that is fundamentally sound.

Recommendations

Local governments deserve considerable credit for what has already been achieved. Many have scaled up materials recovery facility operations, passed enabling ordinances, entered public-private partnerships, and run community-based recovery programs that translate national policy into activity on the ground, and several reported improved diversion rates during consultative sessions. The next stage is more demanding than the first. It requires enforcement that carries real consequences, formal inclusion of informal recyclers, dedicated infrastructure for waste streams currently unserved, reliable data moving between national and local

levels, and genuine accountability for obligated enterprises against their recovery targets.

Recommendation 1: Strengthen enforcement and compliance

Enforcement is the mechanism that moves the legal framework from statute to practice, and it is the single area where the return on additional effort is highest, because the authority already exists and does not require new legislation to activate. Both local governments and obligated enterprises have work to do here, and the measures below are within existing powers.

For local governments and national agencies,

- *Enforce consistently and without exemption.* Apply "no segregation, no collection" as a standing rule rather than a periodic campaign and monitor whether barangay materials recovery facilities are genuinely operating rather than simply existing. National agencies should require local governments to conduct and submit Waste Analysis and Characterization Studies annually or at least every two years, so that national planning and local investment decisions rest on measured composition data rather than national averages that may bear little relation to any particular locality.
- *Activate independent verification.* Operationalize the third-party audit systems that RA 11898 already requires, so that the plastic recovery claims of large enterprises are verified rather than accepted. Without audit, the reporting system rewards firms that report well over firms that recover well.
- *Apply the penalties that exist.* Impose the administrative fines and criminal penalties already provided under RA 9003 and RA 11898. Unenforced penalties are worse than no penalties, because they signal that the entire framework is optional.

For large enterprises and civil society organizations,

- *Report accurately and transparently.* Register all EPR programs and publish annual plastic footprint reports in a form that can be independently audited and compared across firms, which is a precondition for the market recognizing genuine performance.
- *Invest in collection infrastructure.* Fund local collection networks and producer responsibility organizations as they build recovery capacity,

on the understanding that the targets cannot be met by purchasing credits against material someone else was already collecting.

- *Redesign for recoverability.* Reduce the volume of non-recyclable material entering the waste stream at the design stage. Recovery targets applied to packaging that cannot economically be recovered will not be met regardless of how much is spent downstream.

Recommendation 2: Incentivize, not only penalize

Penalties establish a floor of compliance but they rarely produce performance above it, and they are politically expensive for local officials to apply to their own constituents. Incentives work in the opposite direction, rewarding the localities and firms that exceed requirements and creating visible examples that others can follow. The following measures are within the fiscal and administrative powers of most local governments.

- *Provide performance-based grants.* Award financial grants or equipment upgrades to barangays that exceed diversion targets or maintain the most effectively run materials recovery facilities, using measured data rather than self-assessment as the basis for the award.
- *Tax relief for circular businesses.* Offer local business tax discounts or expedited permit processing to enterprises operating substantive EPR programs or shifting to recoverable packaging, which reaches firms below the PHP 100 million asset threshold that the national law does not cover.
- *Household reward schemes.* Operate trash-to-cash or points-for-waste programs allowing residents to exchange segregated recyclables for basic commodities or utility discounts, following the Barcelona model where economic return rather than exhortation sustained participation.
- *Public recognition.* Establish circular economy awards that identify and publicize best practice, creating competitive pressure between barangays and local enterprises at very low administrative cost.
- *Technical support for upcyclers.* Provide training and resources to local entrepreneurs converting waste into marketable products, so that small circular businesses can reach a scale at which they become self-sustaining rather than dependent on program funding.

Recommendation 3: Include the informal waste sector

Waste pickers, itinerant buyers, and junk shop operators already perform a large share of the material recovery that formal systems report as their own output. They work without protective equipment, without health coverage, without legal standing, and at prices set by intermediaries with far greater bargaining power. Excluding them is both an equity failure and an operational one, because it means the state has no visibility over a significant fraction of national recovery and no ability to improve its efficiency or safety.

- *Registration and cooperative formation.* Establish local registries and assist workers in forming cooperatives or associations, which provides legal recognition, access to social protection, and the collective bargaining position needed to negotiate with buyers on more equal terms.
- *Occupational safety and health.* Provide personal protective equipment, health insurance coverage, and training in the safe handling of hazardous materials, particularly for those handling electronic and medical waste fractions.
- *Integration into EPR value chains.* Require producer responsibility organisations to contract formally with informal collectors at guaranteed fair prices, which gives the organizations a verified and traceable supply base while giving collectors income security.
- *Access to public infrastructure.* Permit informal workers to use barangay materials recovery facilities as safe sorting and storage points, which improves both working conditions and the quality of the material recovered.
- *Skills and enterprise development.* Offer training in business management and higher-value upcycling so that workers can move up the value chain rather than remaining permanently at its lowest-margin point.

Recommendation 4: Expand electronic waste recovery

Electronic waste is the fastest-growing stream in the country and the least served by existing infrastructure. It carries hazards that ordinary municipal waste does not, including lead, mercury, and cadmium, and it is currently handled largely by informal dismantlers using open burning and acid leaching in residential areas. It also contains the highest concentration of recoverable value of any waste stream, which means the economic case for building proper capacity is stronger here than almost anywhere else in the system.

- *Designate capable facilities.* Update local mandates so that specified materials recovery facilities are equipped to receive and store special wastes

such as electronics safely pending transfer to accredited recyclers, rather than leaving households with no lawful disposal route at all.

- *Mandatory take-back.* Use the EPR framework to require electronics manufacturers and retailers to operate accessible drop-off points for end-of-life devices, sited where consumers actually shop rather than at industrial facilities they will never visit.
- *Formalize e-waste collectors.* Bring informal dismantlers into the regulated chain through training, protective equipment, and access to safe processing sites, which addresses both the occupational hazard and the environmental contamination that current practice produces.
- *Sustained public awareness.* Run local campaigns explaining why electronics must be separated from general waste, with specific reference to the health consequences of the components involved, since abstract environmental messaging has repeatedly proven less effective than direct health framing.
- *Accredited processing partnerships.* Broker standing agreements between local governments and DENR-accredited treatment facilities so that collected material is processed using environmentally sound technology rather than accumulating in municipal storage.

Recommendation 5: Recalibrate the statutory targets

Targets shape behavior only when they are believed to be achievable. Where they are not, the predictable response is not accelerated investment but declining engagement and increasingly creative reporting, which corrupts the data the whole system depends on. Local chief executives raised precisely this concern during the Co+Lab roundtable on circular economy, and it deserves a serious hearing rather than being treated as resistance to ambition.

- *Evidence-based adjustment.* Use results from the third-party audits under RA 11898 to test empirically whether the 80 percent recovery target by 2028 is achievable across all industries and material types and adjust on the basis of that evidence rather than on advocacy positions from either direction.
- *Infrastructure capacity assessment.* Determine whether the current number and condition of operational materials recovery facilities can physically handle the diversion volumes RA 9003 requires and treat any shortfall as an investment requirement with a cost timeline rather than a compliance failure.
- *Material-specific timelines.* Recognize that multilayer plastics such as sachets require recovery technology that does not yet exist at commercial scale in the

Philippines, and set separate timelines for them rather than allowing one intractable fraction to make the aggregate target unreachable.

- *Tiered deadlines by local capacity.* Consider staggered compliance dates for smaller and rural municipalities whose revenue base cannot support the infrastructure available to highly urbanised cities, paired with national transfers to close the gap over a defined period.
- *Formal feedback channels.* Create a standing mechanism for producer responsibility organizations and local governments to report ground-level obstacles to the National Solid Waste Management Commission, so that the Commission is adjusting policy against operational reality rather than against reports it has no means of testing.

Conclusion

The legal architecture for a circular economy in the Philippines is substantially in place, and the argument for further legislation is weaker than the argument for making the existing statutes work. What is missing is consistent delivery, and the evidence from San Fernando, Barcelona, and Lopez indicates that delivery is achievable under the current framework where local leadership is sustained, where enforcement is applied rather than merely available, and where participation carries an economic return that outlasts the initial enthusiasm of a launch.

Scaling that experience nationally requires five things in combination rather than in isolation. Enforcement has to carry consequences that obligated parties expect to face. Incentives have to reward performance rather than merely punishing failure, because the fiscal and political cost of enforcement-only approaches has proven prohibitive for most local governments. The informal workforce already doing recovery has to be brought inside the system, both because it is unjust to build a national statistic on unprotected labour and because the state cannot manage what it cannot see. Infrastructure has to be built for the streams currently ignored, with electronic waste the most urgent case. And targets have to be calibrated against measured capacity, since a target that no one believes achievable produces neither investment nor honest reporting.

None of this is beyond the reach of current policy instruments. It requires the allocation of resources and the sustained political attention that the framework assumed but did not guarantee. The localities examined here show that where those two things are present, the results follow.

About Liveable Cities Philippines

Liveable Cities works to build more competitive, sustainable, resilient, and liveable cities in the Philippines through public-private partnerships, on the view that the long-term competitiveness of the country rests substantially on the strength and functionality of its cities.

The LCC Co+Lab series convenes local governments, private technology providers, academia, and civil society to share knowledge, pilot solutions, and build partnerships that move cities forward. The Co+Lab on Circular Economy focuses on empowering local governments and communities by demonstrating real-world solutions led by industry frontrunners, in support of more climate-resilient and sustainable cities.

References

Republic Act 9003. Ecological Solid Waste Management Act of 2000.
<https://www.officialgazette.gov.ph/2001/01/26/republic-act-no-9003/>

Republic Act 11898. Extended Producer Responsibility Act of 2022.
https://lawphil.net/statutes/repacts/ra2022/ra_11898_2022.html

United Nations Environment Programme (2026). The UN Advisory Board names 20 city leaders in zero waste.

Municipality of Barcelona. AgriHope: There is Hope in Agriculture (LGU Barcelona-owned Tourism Farm Site).

<https://barcelona.sorsogon.gov.ph/news/agrihope-there-is-hope-in-agriculture-lgu-barcelona-owned-tourism-farm-site/>