Design Guidelines

Recyclability of Flexible Packaging Materials

Kenya Plastics Pact

Prepared by Kenya Plastics Pact (KPP)

2026

Table of Contents

Acronyms and Abbreviations

BOPP	Biaxially Oriented Polypropylene
CEFLEX	The Circular Economy for Flexible Packaging initiative
CPP	Cast Polypropylene
DRS	Deposit-Return Scheme
EAA	Ethylene Acrylic Acid Copolymer
EEA	Ethylene Ethyl Acrylate Copolymer
EBA	Ethylene butyl acrylate
EMA	Ethylene methyl acrylate
EMAA	Ethylene Methacrylic Acid Copolymer
EPR	Extended Producer Responsibility
EVA	Ethylene Vinyl Acetate
EVOH	Ethylene Vinyl Alcohol
g/cm^3	grams per cubic centimeter
HDPE	High-Density Polyethylene
LDPE	Low-Density Polyethylene
LLDPE	Linear Low-Density Polyethylene
KEPSA	Kenya Private Sector Alliance
KPP	Kenya Plastics Pact
MDPE	Medium-Density Polyethylene
MRFs	Material Recovery Facilities
mN/m	millinewton per metre
PE	polyethylene
PET	Polyethylene Terephthalate
PETG	Polyethylene Terephthalate Glycol
PLA	Polylactic Acid
PP	Polypropylene
PROs	Producer Responsibility Organisations
PS	Polystyrene
PVC	Polyvinyl Chloride
PVDC	Polyvinylidene Chloride
SIB-K	Sustainable Inclusive Business Kenya
SUPs	Single Use Plastics
SWM	Sustainable Waste Management
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organisation
WSPs	Waste Service Providers

Background

In Kenya, **unsustainable human activities**, such as the wide overreliance on the take-make-waste economic model, exacerbate resource overconsumption and **generate large volumes of waste**, including problematic plastics.

Most businesses in the country, operating across diverse value chains (hotels, restaurants, and catering, food and beverage, textile and fashion, propagation and cut flowers, etc.), highly depend on single-use plastics (SUPs) as packaging materials for their products. Plastic packaging materials, such as Polyethylene Terephthalate (PET) bottles and flexible items (films, pouches, sachets, and wrappers), have replaced traditional packaging methods, including glass bottles, metal cans, jute sacks, and kraft bags (duro/mafuco). Today, the economic footprint of this transformation is massive, Kenya's flexible packaging market is valued at USD 2.24 billion in 2026 and is projected to scale to USD 2.52 billion by 2031, expanding at a compound annual growth rate of 2.35%[1]. Uniquely shaped by the socio-economic realities of Kenya's *kadogo* economy, the flexible plastic packaging landscape is dominated by high-performance micro-formats. This decentralized consumer model relies heavily on a complex matrix of polymers: structural polyolefins like Polyethylene (PE) and Polypropylene variants (BOPP/CPP) for high-turnover snacks and staple wrappers, laminated Polyethylene Terephthalate (PET) for low-unit-cost multi-layer sachets and Polyvinyl Chloride (PVC) for specialized functional applications such as retail cling films and tamper-evident closures.

Kenya possesses a robust plastics manufacturing and conversion sector with local industry leaders actively producing films, containers and various plastic items, however, the country lacks primary petrochemical infrastructure for the production of virgin plastic resins. Consequently, the industry remains dependent on the importation of granulates and resins to feed local manufacturing lines. According to Ipsos, most plastics are imported from China, India and the United Arab Emirates (UAE)[2]. Extensive research under the Kenya Plastics Action Plan disclosed that sorted plastics fractions are also imported from Tanzania and Uganda for recycling within Kenya[3].

Industries reliant on SUPs

- hotels
- restaurants and catering
- food and beverage
- textile and fashion
- propagation and cut flowers

A report by UNCTAD (2022) discloses that resultant plastic waste from SUPs in developing countries originates from imported plastic products, packaging and plastic products produced locally[4]. An estimate of between 453,781 and 567,000 metric tonnes of primary and non-primary plastics was imported in Kenya in 2017[5].

Plastic imports

453,781 - 567,000 tonnes

imported in 2017

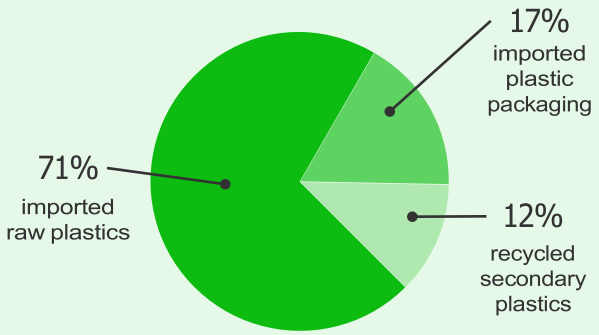
mostly from: China • India • UAE

Data indicates that Kenya's annual consumption of plastic packaging materials in 2019 was 259,252 tonnes, with imported raw plastics accounting for 184,708 tonnes, representing 71 per cent[6]. Plastic packaging importation accounted for 44,086 tonnes annually, while recycled secondary plastics were estimated to be 30,475 tonnes. Only 18 per cent (46,988 tonnes) of the total volume of 259,252 tonnes of plastic introduced in Kenya in 2019 was recycled[7]. The annual volume of plastic waste in Kenya has increased over the years due to rapid economic growth, with an estimated 880,000 tonnes of plastic waste generated in a year[8].

Plastic packaging consumption

259,252 total tonnes

consumed in 2019



The recycling gap

18% recycled*

— *46,988 tonnes* —

82% not recycled

— *212,264 tonnes* —

**in 2019*

Plastic waste in Kenya today

880,000 TONNES

current estimated plastic waste generated in a year

Source. Plastic waste pollution in Kenya.

Due to a lack of adequate and state-of-the-art waste management facilities, large volumes of waste from different streams, including used flexibles, are directed to landfills and incineration, exacerbating microplastic contamination, reducing nature's aesthetic value and increasing greenhouse gas emissions. Collected plastic items across the country are informed by polymers that are usually easier to pick and sort, such as rigid plastic polymers rather than flexibles. Over the years, discarded plastic waste has been blamed for contributing to increased clogs in storm drainage channels and sewer lines, leading to flash floods, particularly in Kenya's urban informal settlements[9].

Continuous accumulation of plastic waste provides favourable breeding grounds for mosquitoes, increasing the prevalence of chikungunya, dengue fever, elephantiasis and malaria. Plastic waste increases the incidences of entanglement of marine organisms and ingestion, preventing soil aeration and suffocating microbes. Exposure of discarded plastics to sunlight, waves, and open burning releases potent greenhouse gases such as carbon dioxide, ethylene and methane.

In 2025, effective management of plastic waste (mainly through recycling) in Kenya stood out at between 3-8 per cent[10]. This significant recycling gap highlights a structural bottleneck in Kenya's current waste management infrastructure. Flexible packaging, which represents a large and complex portion of this waste stream, is currently excluded from high-value recovery due to material design incompatibilities.

The packaging value chain must prioritize 'design-for-recyclability' to close this loop, ensuring that flexible materials are technically capable of being recovered and repurposed. These guidelines establish the technical framework necessary to transition the local industry away from problematic multi-material structures toward compatible mono-material solutions. The adoption of these standards enables manufacturers and brand owners to play a pivotal role in accelerating Kenya's transition to a sustainable and circular packaging economy.

The ban on manufacturing, importing and selling SUPs bags through Gazette Notice 2356[11] in 2017 has been considered a milestone in addressing the pervasive plastic pollution rampant in urban areas, hinterlands and fragile ecosystems. Efforts to divert SUPs from protected areas in Kenya were strengthened through Gazette Notice 4858[12], which prohibited the use of various plastic items, such as PET bottles, straws, etc., within national parks, national reserve areas, conservation zones and other designated wildlife protected areas.

Despite the country's progressive waste management landscape, low plastic collection and recycling rates, especially flexible packaging materials, continue to pose pernicious health and environmental effects.

Source. Kenyan woman in a beach clean up exercise

Monolayer transparent flexible recycling

Recycling of flexibles plastics is not widely practised in Kenya. According to a report by the United Nations Industrial Development Organisation (UNIDO), only ten companies, mainly located in Mombasa and Nairobi, have invested in recycling transparent monolayer LDPE[13]. However, the recycling rate by companies is significantly lower, with each company recycling only a few hundred kilograms per day, and much of the flexible packaging is disposed of in the environment. Most of the recycled transparent monolayer flexible plastic items are sourced from large-scale retailers, such as supermarkets. Recovered monolayered transparent flexible plastics undergo a systematic recycling process, including quality control, friction washing and thermal drying to be pelletized into clean granules. These recycled pellets are then utilized to manufacture new plastic items.

Coloured monolayer flexibles face significant recycling hurdles due to the challenges of managing pigment contamination within mechanical recycling streams. Moreover, HDPE monolayer flexibles, mostly from industrial waste and rejects, are currently recycled in Kenya; however, at a low rate compared to the generation rate. Other flexible items, especially films and foils produced from PP, PETs and bio-PP, contaminate and distort the recycling process, making them difficult to recycle.

Multilayer transparent flexible recycling

Multilayer flexibles made up of a mixture of plastics and other materials, such as aluminium, they are utilised to extend the shelf life and enhance food safety and quality. The separation of composites in multilayered flexibles requires specialised equipment and processes. A mixture of different plastic polymers and other materials contaminates the recycling process due to the varying melting points of the materials. UNIDO report recommended that the EPR scheme propose a financial incentive to spur recycling of multilayer flexibles[14]. Furthermore, the incentives should cover the substitution of multilayer flexibles with monolayer flexibles.

Kenya Plastics Pact (KPP)

Recognising the need for collective action, especially among the private sector industry players, to address the growing plastic pollution in Kenya, **Kenya became the 12th country to join the Plastics Pact Network** convened by WRAP (Waste and Resources Action Programme) and the Ellen MacArthur Foundation.

The Kenya Plastics Pact (KPP) was launched in 2021 and is led by Sustainable Inclusive Business Kenya (SIB-K), the knowledge centre under the Kenya Private Sector Alliance (KEPSA). KPP is an ambitious and highly collaborative platform that brings together 40 plastic value chain businesses to advocate for a circular plastic economy. The members include plastic packaging materials manufacturers, brands and businesses, waste service providers, media and legal experts to ensure that Kenya's transition to a circular economy aligns with the wider interests of various stakeholders. The achievement of KPP targets is primarily driven and guided by KPP members through working groups that comprise KPP members and supporters.

Since its inception, KPP has positioned itself as a torchbearer in galvanising Kenyan businesses to embrace circular business models. These models are underpinned by eliminating problematic and unnecessary plastic packaging materials within production and policy engagement to align Kenya's circularity transition with a favourable business environment. Against this backdrop, KPP has continuously developed knowledge dissemination materials to equip businesses (packaging materials manufacturers, brands, wholesalers, retailers and WSPs) with the requisite knowledge of circular business models and practices.

KPP is an ambitious and highly collaborative platform that brings together 40 plastic value chain businesses to advocate for a circular plastic economy

Join the pact here

Purpose of the Guidelines

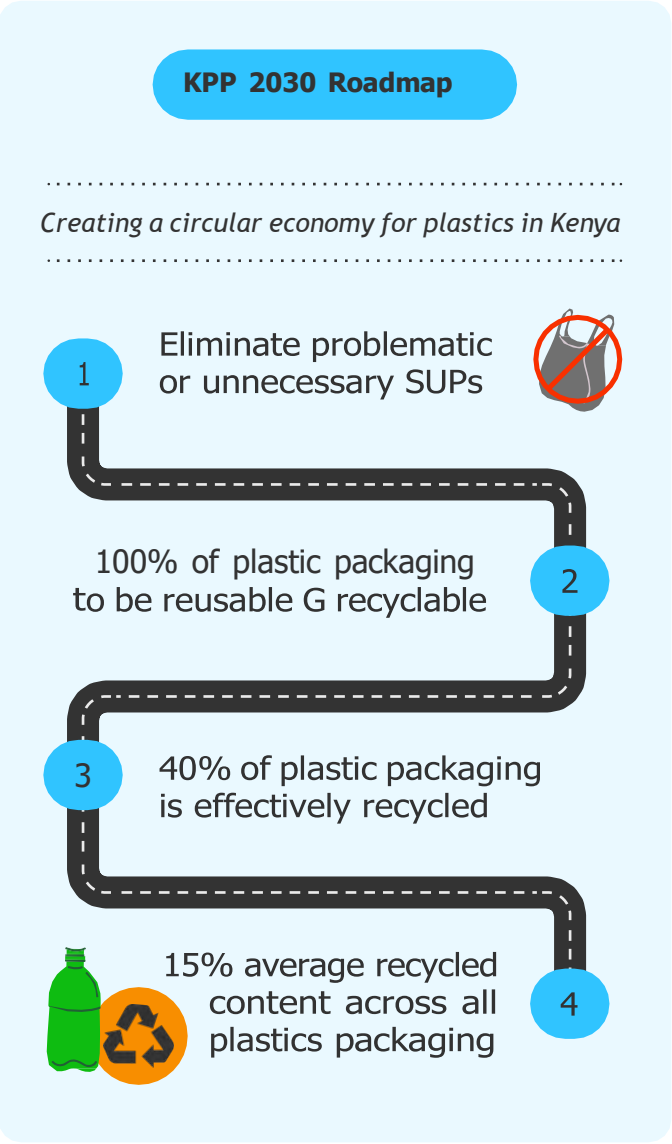
The **primary purpose of the guidelines** is to provide relevant plastic value chain actors in Kenya with **in-depth information** on mainstreaming circular approaches in the design, use and handling of flexible packaging materials.

Championing the adoption of circularity agendas in designing, manufacturing, using and handling flexible packaging materials aligns with KPP's ambitions to galvanize Kenya's private sector transition from a linear economic model to a closed-loop system. KPP is working towards its 2030 Roadmap ambition of creating a circular economy for plastics in Kenya.

The Roadmap is grounded in 4 targets:

1. Eliminate problematic or unnecessary single-use packaging items through redesign, innovation or reuse delivery models.
2. 100% of plastic packaging to be reusable and recyclable.
3. 40% of plastic packaging is effectively recycled.
4. 15% average recycled content across all plastics packaging.

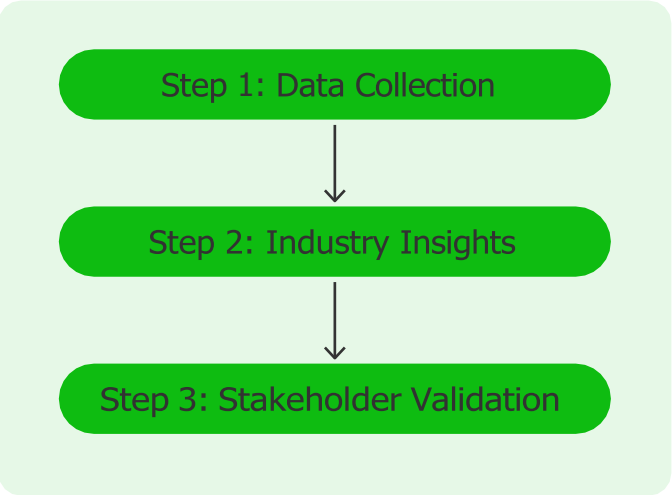
The guidelines are also grounded in international conventions, aspirations and best practices. For example, the Circular Economy for Flexible Packaging initiative (CEFLEX) presents a solid approach to increasing the collection and recycling of flexible packaging materials. Championing circularity in flexible packaging materials contributes to several Kenyan waste management policies, such as the Sustainable Waste Management Policy 2021, the Sustainable Waste Management Act 2022, the Environmental Management and Coordination (Management and Control of Plastic Packaging Materials) Regulations, 2024 and the Extended Producer Responsibility Regulations 2024, which aim to strengthen a holistic transition to the circular economy through assisted compliance strategy.



Methodology

A **mixed-methodology approach** was adopted, relying on both secondary and primary data to inform the development of the Guidelines.

The integration of two data types provided an avenue to acquire in-depth and underlying data on the current situation of flexible packaging materials in Kenya (*volume produced, waste generated, existing management strategies, impediments to effective management practices, and current policy priorities*). Firsthand insights were gathered from KPP members on existing challenges of handling used flexible packaging materials, alternatives to flexible packaging and best practices to manage used flexible packaging materials. The Guidelines was subjected to a validation process attended by KPP members and relevant stakeholders.



Target Audience

The guidelines have been developed **targeting diverse stakeholders** in Kenya's plastic waste value Chain.

The target audience includes:

A

Plastic packaging materials manufacturers

B

Brands and businesses

Retailers, wholesalers, producer responsibility organisations, innovators.

C

Waste service providers

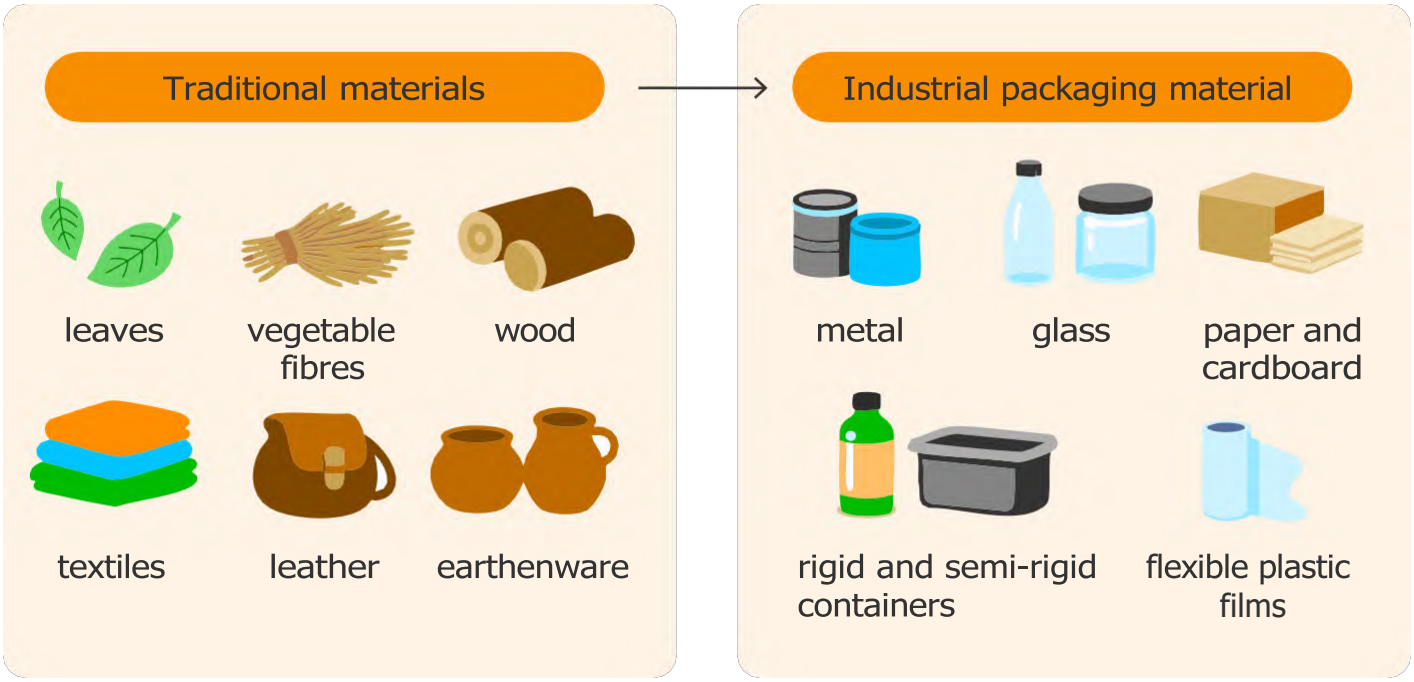
Collectors, recyclers, including informal groups.

D

Consumers

Flexible Packaging Materials Composition

Over the last two centuries, the packaging of edible items has evolved from **traditional materials to industrial packaging materials.**



The increased use of industrial packaging items results from growing concerns for higher food preservation standards, ease of logistics and unique branding (packaging food in items that allow brand branding and information dissemination to consumers). The use of flexible packaging materials is widely growing, with the materials utilised in packaging edible items, liquid and dry chemicals, and petrochemical products.

Flexibles comprise packaging materials that can readily be changed in shape when wrapped up with a product and closed can easily be changed in shape. In other words, flexible packaging materials are either monolayer or multilayer plastic films and items (bags, wrappers) with a thickness of less than 250 micrometers (µm).

Flexible packaging materials can be categorised into:

1. **Monolayers**
2. **Multilayers**
3. **Metalised and metal foil films**

1. Monolayers

Flexible plastic packaging materials in this category contain a single film layer, mainly made up of high-density polyethylene (HDPE), linear low-density polyethylene (LLDPE), low-density polyethylene (LDPE), and polypropylene. Monolayer flexible plastic packaging material may contain a single plastic polymer or a blend of compatible polymers. Common examples of monolayer flexible packaging include self-sealing food storage bags, stretch and shrink wraps and basic consumer pouches. These formats generally offer superior recyclability compared to multilayer alternatives, provided the material remains free from incompatible polymer contaminants.

2. Multilayers

Multilayer flexibles comprise packaging items with several layers, usually 2 or more than 2 layers of diverse plastic films, adhesive inks and other materials such as lids made from rigid plastics. The plastic film layers are firmly held together by adhesives or structural bonding of the polymers. Across the globe, there is a lack of an effective, established disposal and recycling method for used multilayer packaging materials due to their composition of different materials. It has been widely reported that the separation of different layers of films is irreversible due to strong adhesive bonding, variations in the melting point and chemical incompatibility of different polymers used. Thus, used multilayered flexible packaging materials are widely directed to landfills and incinerators, aggravating adverse environmental pollution and health risks.

Under multilayers, flexible packaging materials are further divided into:

a. **Coextruded films**
b. **Laminates**
c. **Adhesives**

a. Coextruded films

The multilayered flexibles are films produced through the coextrusion process. Different layers of polymers are bonded into one multilayer film in a molten state. For example, the LLDPE layer, which can be used in packaging edible items, is combined with the HDPE layer, which is harder, stiffer and boasts higher tensile and bursting strength, to create a thinner film with enhanced mechanical properties.

In other scenarios, polyethlene films are bonded with poly (vinylidene chloride) (PVDC) polyamide and ethylene vinyl alcohol (EVOH). The combination allows HDPE films to act as a moisture barrier, ethylene vinyl acetate (EVA) as a sealant and EVOH as an aroma barrier. Multilayer films are widely used in the food industry due to their ability to increase shelf-life by controlling moisture, oxygen and carbon dioxide transmissions, which is key in food preservation. It is estimated that 17 per cent of all packaging films are multilayer films.

Table 2: Common multilayer flexible packaging films and their application

Multilayer	Application	Recyclability	Remarks
PE mono material LLDPE/HDPE/ LLDPE	Grocery bags, collation shrink film	High	All layers are polyethylene-based, compatible and widely recyclable in PE streams.
PE with Low EVA	Cereal liners	High	Recyclable without concern if EVA content is < 5% of total weight. If EVA is > 5%, its recyclability rate is moderate.
PE with Low EVOH Barrier (LLDPE - Tie - EVOH - Tie - LLDPE)	Fresh meat, cheese, barrier pouches	High	Considered fully recyclable globally if EVOH is ≤ 5% of total weight and used with appropriate tie-layers.
High-Barrier PE (LLDPE - HDPE - Tie - EVOH - Tie - HDPE - LLDPE)	Processed meat, high-barrier food packaging	Moderate	Recyclable if total EVOH remains low, but increased layer complexity and higher tie-layer volumes require optimal sorting.
PE / Polyamide (PA) (LLDPE - Tie - PA - Tie - LLDPE)	Heavy-duty bags, bone-in meat packaging	Low	Polyamide (Nylon) and PE are incompatible. PA creates structural defects during PE extrusion unless specialized compatibilizers are present.
LLDPE-Tie-PA-EVOH-PA-Tie-LLDPE	High-performance fresh food packaging	Very Low	Multi-polymer blending of incompatible layers (PE, PA, EVOH) results in severe texturing and structural failure in standard recycling.
Aseptic / Liquid Packaging (Paper - LDPE - Al - LDPE)	Juice boxes, long-life milk cartons	Very Low	Mixed materials (cellulose + plastic + aluminum foil) require specialized hydropulping separation. Not compatible with standard flexible streams
PET Laminated Packaging (PET - Tie - LDPE - Al - LDPE)	High-barrier sachets, stand-up pouches	Very Low	Incompatible structural layers (PET and PE) combined with aluminum foil. Non-recyclable in mechanical flexible recycling systems.

b. Laminates:

Laminates are produced by bonding different plastics, or in some cases, a combination of paper or aluminium layers with adhesives applied to the less absorbent layer.

c. Adhesives:

Adhesives are high-performance heat-activated sealants made of lightweight polymers (polyester, polyethylene, polyvinyl chloride and thermoplastic resins). Solvent-based adhesives pose a significant environmental challenge due to emissions of volatile organic compounds (VOCs), being highly flammable, and having higher economic implications due to the high cost of solvent recovery equipment.

Source. Various plastic packaging at a Kenyan store.

3. Metalised and metal foil films

Flexible packaging items in this category contain a layer of plastic film (commonly PET or BOPP) that has undergone vacuum metallisation to deposit a thin layer of aluminium, usually 30-60 nanometres thick. This metallised layer significantly enhances the film's barrier properties, minimizing oxygen and moisture transmission rates while providing a highly reflective aesthetic. Metallised films are predominantly utilized in high-barrier applications, including the packaging of sensitive fast-moving consumer goods such as food products, electronics and medical supplies.

Classifications of flexible metalised and metal foil-containing films include:

a. Metalised polypropylene.
b. Metalised poly(ethylene terephthalate).

a. Metalised polypropylene

This film contains a nonpolar surface with low energy tension. However, the film is treated with coronal discharge plasma to increase surface energy to around 38 mN/m. Typical uses of metalised biaxially oriented polypropylene (BOPP) extend to the packaging of biscuits, potato chips, meat and other edible products, gift wrappings and personal care products.

b. Metalised poly(ethylene terephthalate)

Metallised Polyethylene Terephthalate (MetPET) films utilize a vacuum vapour deposition process to integrate an angstrom-level aluminium barrier onto the polymer substrate. This ultra-thin deposition has proven highly effective at retaining aroma and flavour profiles in packaged foods while significantly minimizing oxygen and moisture transmission rates. However, post-consumer metallised PET flexible packaging materials present significant mechanical recycling challenges and are predominantly directed to landfills.

Mainstreaming Circular approaches in the design and management of flexible packaging materials

1. Complete elimination

This approach advocates for the complete elimination of problematic flexible packaging components, specifically PVC and PETG shrink sleeves on PET bottles, which act as severe systemic contaminants in the PET recycling stream. In order to achieve necessary tamper evidence without utilizing incompatible flexible sleeves, brands are encouraged to design out the sleeve entirely. Standard polyolefin (PE/PP) caps with built-in breakaway safety bands can provide a functional seal and auditory verification, a distinct '*clicking*' sound upon opening, assuring consumers of product integrity without introducing polluting flexible elements into the recovery chain.

A complete elimination of problematic and unnecessary flexibles represents an ideal pathway for reducing plastic items that have difficulties in recycling.

Complete elimination of problematic and unnecessary plastic flexibles requires in-depth and critical business-driven hands-on activities. Businesses need to rely on accurate assessment and evaluation to map out plastic flexible packaging materials in their production, their volumes, benefits and challenges.

The data will provide well-grounded inventory and information on unnecessary flexibles to phase out, product redesign and embrace alternatives with higher recycling rates. Phasing out problematic and unnecessary flexible packaging materials needs to be undertaken within set timelines and policy priorities.

2. Innovate, reuse and recycle

Innovating, reusing and recycling captures an upstream intervention for brands to redesign their products to embrace environmentally friendly and sustainable packaging materials. This approach necessitates a shift to a new business model grounded in refillable and returnable packaging materials. New business models upholding refill and reuse systems will significantly reduce the plastic menace from rampant packaging materials in Kenya. Brands and businesses in Kenya can work closely with large-scale retail stores to set up refillable stations for their products, especially in urban areas where the plastic menace contributes to adverse environmental deterioration.

However, shifting to new business models will require:

a. **Extensive research and development:** Brands should invest in well-evidenced and substantial research to assess the benefits of adopting refill and reuse systems in their production, consumer perceptions and receptiveness and the potential impact of the shift.

b. **Setting an internal target** for the gradual introduction of refill and reuse systems, i.e., identifying products to kickstart the process, geographical locations, etc.

c. **Stakeholder engagement:** Considerable awareness and knowledge transfer through mass, print and social media and other physical consumer engagement forums (exhibitions) on the need to introduce refillable and returnable packaging to phase out heavy reliance on flexible plastic packaging materials.

d. **Government support:** subsidies, tax rebates and breaks to brands advancing refillable and returnable packaging will strengthen the elimination of problematic and unnecessary flexible packaging materials. Investing in waste management infrastructures such as material recovery facilities, as captured in Section 14 of the SWM Act 2022, will be crucial in increasing the collection, sorting and recycling of refillable and returnable packaging materials.

3. Alternatives

Compostable flexible plastics are often positioned as a sustainable alternative to conventional petroleum-based packaging[15]. Many of these materials are biobased, derived from sources such as corn, cellulose or plant oils; however, biobased origin alone does not confer compostability, as certain biopolymers, such as bio-polypropylene, exhibit identical environmental persistence to their fossil-based analogues.

Genuine compostable plastics require specific environmental conditions, typically achievable only in industrial composting facilities, including elevated temperatures, sustained microbial activity, and controlled moisture, and their performance is validated against internationally recognized standards such as ASTM D6400 or EN 13432[16].

Under these conditions, compostable flexibles degrade into carbon dioxide, water and biomass, effectively returning organic matter to the ecosystem; however, this process does not reclaim the original polymer and thus, compostable plastics represent a form of organic recycling rather than true material circularity.

Consequently, the environmental efficacy of these materials is contingent upon appropriate infrastructure, certification and post-consumer management, highlighting the limitations of framing compostables as a fully circular solution. Consequently, compostable and biodegradable plastics (such as PLA or PBAT) act as severe contaminants in conventional mechanical recycling streams.

Source. Workers load a large bundle of collected plastic bottles onto a recycling truck, highlighting efforts to recover and manage post-consumer packaging waste.

Effective handling of used flexible plastic packaging materials is a key priority issue that requires the concerted collective action of consumers, brands, PROs, waste service providers and retailers.

The beginning point of effective management of used plastic flexibles highly depends on changes in consumer perceptions and attitudes and the availability of waste management infrastructures. Waste management infrastructures through public sector investments as mandated by the SWM Act 2022, private sector-driven investments or Public-Private Investment Partnerships. Kenya lacks adequate waste management infrastructure including collection points, transportation systems and material recovery facilities, limiting opportunities for recycling and other sustainable end-of-life solutions

Consumers' primary role in managing used plastic flexible packaging items includes emptyability, sorting and disposal at collection points.

a. **Emptyability**: This refers to the complete removal of any residue of the packed content (food, chemicals, detergents, etc.) to avoid contaminating the collection and recycling process. Residues increase the recycling cost due to extra resources to clean the used flexibles and lower the quality of recycled content.

b. **Sorting:** Accelerating the recovery and recycling rates of flexible plastics, coordinated advocacy by authorities, manufacturers, brands and WSPs must evolve beyond general awareness into precise, actionable visual communication. Specific information to be disseminated to consumers includes sorting of the packaging materials based on different parts, e.g., caps, lids, pouches, sachets, wrappers, zips and labels.

   In a scenario where brands require problematic flexible packaging materials, their design should avoid using incompatible parts that present difficulties to consumers when separating. Brands should include clear instructions for sorting and handling the flexibles during disposal to avert environmental and health risks.

c. **Plastic flexibles' final disposal and recycling** will depend heavily on Kenya's existing infrastructure and available technologies. Investing in technologies such as near-infrared (NIR) to sort and separate different plastic polymers in flexibles will be crucial in increasing the collection, sorting, and recycling of problematic items.

   As noted earlier, actualising Section 14 of the SWM Act 2022, which mandates each county government to set up an MRF, will be a key milestone in the management of used flexibles in Kenya. However, private WSPs, especially recyclers, can invest in private MRFs due to large volumes of waste to increase the recovery of recyclables.

Increase EPR Fees for Flexible Packaging Materials

Kenya has made significant strides in formulating EPR Regulations that oblige **brands to bear financial and physical responsibility** for managing waste from their products at the post-consumer phase.

Rolling out EPR Regulations presents an avenue to engage producers (brands and businesses) in waste management and reduce the pressure among consumers and WSPs. EPR provides strategies to address the low market value of recyclates, inadequate collection rates and the risks associated with material complexity and contamination. Kenya's EPR advances upstream waste management interventions, such as design for longevity, the use of alternatives and circular business models, as well as downstream strategies (collaborative efforts between businesses, PROs, and WSPs to increase collection and recycling rates).

Increasing EPR fees for problematic and unnecessary flexible packaging materials can effectively incentivize businesses to adopt sustainable alternatives and redesign products. EPR fees recovered can be directed to investment in public and private MRFs and recycling firms to increase flexibles' collection and recycling rates. Justifications for increasing EPR fees include:

1. Low collection rates due to unfair and low market valuation and pricing rates-Informal waste pickers, mainly driving waste management in Kenya, avoid collecting flexibles due to lower selling prices from recyclers.
2. Difficulties in recycling flexibles are primarily aggravated by the lack of effective and adequate waste management facilities.

An approach to increase EPR fees for flexibles will involve:

a. **Fee differentiation**: PROs and WSPs can charge a higher EPR fee for non-recyclable flexibles and a lower fee for packaging materials with higher collection and recycling rates.

b. **Establish state-of-the-art waste management facilities:** Brands and businesses that cannot phase out plastic flexibles will require thriving waste management facilities established through EPR fees by the public sector, private players or PPPs.

c. **Involvement of informal waste practitioners:** This will require the establishment of fair valuation and market pricing structures for recovered flexible waste to encourage collection by informal waste pickers.

d. **Transformative consumer engagement campaigns:** Set aside an EPR fee to roll out nationwide consumer engagement on practical approaches to managing flexible waste, such as introducing a Deposit-Return Scheme (DRS). The DRS can introduce a return mechanism, disposal of used flexible packaging items at wholesalers and retailers points, communal collection centres, discounts on take-back schemes, and refill and reuse systems.

Design for Recycling Guidelines for Flexible Packaging Materials

The **composition of flexible packaging materials** strongly determines its recyclability at the post-consumer phase.

Thus, sorting and recycling used flexible packaging items will necessitate separate processes due to variations in conditions, such as different melting points of various polymers. However, the sorting and recycling process selection can be based on the dominant component in the flexible structure. To avoid bias in selecting the sorting and recycling process based on the surface of a flexible, inside layers can be exposed before the process.

Green

Indicates that the flexible plastic material has a high recyclability rate.

Yellow

Signifies that the item may be technically recoverable within specific recycling streams.

Red

Specifies that the flexible packaging materials have a low recyclability rate and may likely contaminate the recycling process.

However, its material composition and processing limitations render it highly **susceptible to contaminating standard recycling systems** if not subjected to appropriate **segregation and handling protocols.**

Table 3: Design for Recycling Guidelines for Flexible Packaging Materials

Aluminium foil

Material		
• Mono non-ferrous aluminium metal components.		• Aluminium foils with plastic film layers and inks.
Additional components/attachments/decoration		
• Embossed labels.		• Avoid use of PVC labels- contaminate recyclates.

Kraft paper- duro/mafuco,

Material		
• Packaging items must consist of a minimum of 85% cellulose fibre by weight. Any non-fibre components (*barrier coatings, adhesives, inks or structural reinforcements must not exceed a combined total of 15%* (or *5% for strict mono-material compliance*) of the total packaging mass. Coatings must be water-soluble or easily dispersible during the standard pulping process to ensure full fibre recovery.	• Paper bags mainly made from non-wood materials (cotton and hemp) contaminate the recycling process. • However, their use in small quantities does not pose any harm. • Paper bags with between 85-95% wood pulp with one-side plastic laminate	• Paper bags with plastic laminates and wax coatings in both sides. • Siliconised paper. • Papers with wet-strength finish.
Additional components/attachments/decoration		
• Total printing surface coverage must not exceed 50% of the total packaging area. • Water-based, non-bleeding inks are permitted. Use of heavy-metal-based pigments, metallic foils or UV-cured inks that inhibit pulp dispersion is strictly prohibited.	• Fewer adhesive items (labels and viewing windows), if preferred, they should be designed to be easily removed from the bag. • Metalised components cover less than 60 % of the bag.	• Inseparable labels and viewing windows and other adhesive items from the main packaging surface. • Printing inks with high mineral oil content.

PE (grocery bags, zipper bags, clothing packaging bags)

Material

• The packaging must consist of ≥90% PE by weight (inclusive of HDPE, LDPE, LLDPE and PE-based copolymers such as EVA, EBA or EMA). This threshold establishes the packaging as a "mono-material" structure, which is essential for compatibility with standard mechanical recycling processes. • Ethylene Ethyl Acrylate Copolymer (EEA), acrylate monomers weight limit ≤ 5 % of the item; • Weight limit of EMAA, EAA copolymers & ionomers ≤ 20% of the item. • Barriers from silicon oxide (SiOx) and aluminum oxide (Al2O3) and carbon plasma coating.	• Multi-layer polyolefin (PE/PP) composite materials, must consist of a minimum of 80% PE by weight (HDPE, LDPE, LLDPE) and a maximum of 20% PP by weight. • Additives but within a limit of < 0.97 g/cm3 of the base material density. • Barrier with ≤ 5% EVOH. • Metalising the base material results in grey or opaque discoloration of the recycled resin, reducing its viability for high-value, transparent applications.	• Non-polyolefin polymers (e.g., PET, PVC, PS, PA) or PP fractions exceeding the 20% limit (resulting in a total PE content < 80%). The incorporation of these materials leads to critical contamination, as non-polyolefin polymers disrupt melt compatibility and compromise the mechanical properties of the recycle. • Use of hydrated magnesium silicate (talc) and calcium carbonate (CaCO3) as adhesive increases the density to ≥ 1 g/cm³. • Barrier- use of aluminium, EVOH, polyamide (PA) and polyvinylidene chloride (PVDC) beyond their limits. • Dark inks may be a contaminant to recyclates. The use of dark inks does not inherently disrupt the recycling process, however, it results in darker-coloured recyclate, which typically has lower market value due to limited end-use applications compared to light or natural-coloured recyclate.

Additional components/attachments/decoration

• Total ink coverage must be ≤ 50% of the total packaging surface area. Inks must be water-based or solvent-based, light-colored or translucent. • Labels and closure systems made from HDPE, LDPE, LLDPE and MDPE) to ensure mono-material compatibility. • Decorations made from other material rather than PE to cover ≤ 50% of the main packaging surface. • Engraving, laser marking or embossing of batch codes and dates. • Total weight of non-PE closures must not exceed 5% of the total packaging weight	• Total ink coverage must be ≤ 50% of the total surface area of the packaging. • Only water-based or solvent-based inks compatible with standard wash-off (de-inking) recycling processes are permitted. • Use wet-strength paper labels that do not produce fibres contaminating the recyclates. • PP labels providing a maximum cover of ≤ 50% of the main packaging surface. • Total weight of non-PE closures (e.g., PP zippers or spouts) must not exceed 5% of the total packaging weight	• Decorations that cover > 50% of the packaging surface made from other materials rather than PE. • Labels not made from PP and PE. • Use of bleeding inks. • Adhesives with >5 µm layer of aluminium or other metal material. • Non-soluble adhesives in water and non-releasable in water <40°. • Avoid closures with PET, PLA, PS and PET-G or Non-PE closures that exceed 5% of the total packaging weight.

Polypropylene (PP) pillow bags, pouches, sachets, stickpack

Material		
• PP (≥ 90%) is the primary material for the packaging surface. • Barrier Layers, limited to vacuum-deposited silicon oxide (SiOx) or aluminum oxide (Al2O3) without additional laminates/coatings • Adhesives that do not lead to a density of more than 0.97 g/cm3	• PP must be the primary material, constituting ≥ 80% of the total packaging weight. • Secondary Materials, Minor content of non-PP materials (e.g., Polyethylene layers, EVOH barriers or tie-layers) should not exceed 20% of the total packaging weight. • Barrier with ≤ 5% EVOH. • Metalising the base material contaminates the recyclates resulting in grey colouration.	• Use of hydrated magnesium silicate (talc) and calcium carbonate (CaCO3) as adhesive increases the density to ≥ 1 g/cm³. • Barrier- use of aluminium, EVOH, PA and PVDC beyond their limits. • Dark inks may be a contaminant to recyclates. The use of dark inks does not inherently disrupt the recycling process, however, it results in darker-coloured recyclate, which typically has lower market value due to limited end-use applications compared to light or natural-coloured recyclate.
Additional components/attachments/decoration		
• Unpigmented and transparent or white • Engraving, laser marking or embossing of batch codes and dates. • Labels consist of same material as the main packaging surface. • Closure systems, liners and valves made from PP, HDPE, LDPE, MDPE and LLDPE. • Adhesive and labels- Water soluble/ water releasable at less than 40°C	• Light and translucent colours. • Labels made from wet-strength paper have minimal contamination to recyclates. • Total ink coverage must be ≤ 50% of the total packaging surface area. • Total weight of PP-based closures must not exceed 10% of the total packaging weight to prevent melt-flow and additive-induced "gel" contamination. If the closure is made of non-PP material, its total weight must not exceed 5% of the total packaging weight.	• Use of bleeding inks. • Labels not made from PP and polyethylene (PE). • Decorations that cover > 50% of the packaging surface. • Adhesives with >5 µm layer of aluminium or other metal material. • Non-soluble adhesives in water and non-releasable in water <40° C.

Conclusion

This design guidelines for recycling flexibles present a crucial step toward aligning Kenya's packaging value chain with global best practices in circular economy and sustainable material management.

The guidelines illustrate the complex material compositions of flexible packaging particularly monolayer and multilayer structures and their limitations in recyclability due to polymer incompatibilities, contamination risks, and lack of processing infrastructure. The persistent use of composite laminates, metallised films, and solvent-based adhesives continues to hinder efficient sorting and recycling, exacerbating environmental and health risks.

Notably, the recycling rates for flexible packaging remain unacceptably low, primarily due to economic disincentives and technological constraints. While monolayer flexibles offer more promising pathways for recycling, especially when designed with compatible polymers and minimal decoration, the guidelines highlight the urgent need to redesign problematic materials and implement the newly gazette EPR Regulations 2024.

Kenya's move toward circularity in flexible plastics must now be underpinned by systemic investments in infrastructure such as MRFs, NIR sorting technologies, and scalable chemical recycling. Simultaneously, regulatory instruments like differentiated EPR fees, policy-driven elimination of non-recyclable formats, and standardized design-for-recycling criteria should be enforced. KPP's 2030 roadmap and its collaboration with the private sector provide a foundational governance model to accelerate these efforts. However, without robust consumer education, producer accountability, and end-market development for recyclates, circularity will remain an aspirational goal. Thus, the successful implementation of these guidelines will depend on a multisectoral commitment anchored in science, policy coherence, and inclusive stakeholder engagement to redesign, recover, and reimagine flexible packaging for a sustainable future.

Acknowledgements

The Kenya Plastics Pact (KPP) sincerely appreciates its member organisations for their technical expertise, practical insights and unwavering commitment to advancing circularity within Kenya's plastics value chain. We convey our profound gratitude to Waste and Resources Action Programme (WRAP UK), convener of the global Plastics Pact Network, for its strategic guidance, knowledge resources and continued stewardship in advancing evidence-based transition to circular plastics economy. WRAP's global leadership and technical benchmarks have significantly strengthened the robustness and international alignment of these Guidelines. Special recognition to Abisheck Pawar of the India Plastics Pact for his valuable technical contributions and shared best practices, which enriched the rigor and international alignment of these guidelines.

Citation

Kenya Plastics Pact. (2026). Design Guidelines for Recyclability of Flexible Packaging Materials.

Source. Group of people in a garbage sorting plant in Kenya.

Endnotes

1 Mordor Intelligence. (2026). Kenya flexible packaging market size and share analysis - Growth trends and forecast (2026-2031)
2 Kenya Association of Manufacturers. (2019, November). Kenya Plastic Action Plan: Accelerating a circular economy in Kenya.
3 Ibid
4 United Nations Conference on Trade and Development. (2022). The global plastics crisis: Pathways for a circular economy
5 Eunomia (2018). Plastic Packaging Waste Flows in Kenya. The Danish Environmental Protection Agency, Kopenhagen.
6 Oguge, N. O. (2019). Circular Economy Measures: An Opportunity For Rethinking Plastics Waste Governance in Kenya.
7 Ibid
8 Badenoch, C., Blay, H. L., & Greef, M. D. (2025). Investing in the Waste and Circularity Sector in Kenya Plastic Waste Management Guide.
9 Okuku, E. (2022). Remorseless killer on land and in the sea.
10 Badenoch, C., Blay, H. L., & Greef, M. D. (2025). Investing in the Waste and Circularity Sector in Kenya Plastic Waste Management Guide.
11 Republic of Kenya. (2017, March 14). Gazette Notice No. 2356: The Environmental Management and Co-ordination Act (Cap. 387)—Ban on plastic carrier and flat bags. The Kenya Gazette. https://faolex.fao.org/docs/pdf/ken165294.pdf
12 Republic of Kenya, Ministry of Environment and Forestry. (2020, February). Implementation plan for the ban of single-use plastics in protected areas [PDF]. Retrieved June 16, 2025, from https://www.tourism.go.ke/wp-content/uploads/2020/05/Action-Plan-Single-Use-Plastics-Ban-in-Protected-Areas-February2020.pdf
13 United Nations Industrial Development Organization. (2021, November). Study on Plastic value chain in Kenya [PDF]. Prepared by Thilo Vogeler, George Warutere, Judy Chebet, Jana Brinkmann, Valerie Leisten, Stephan Löhle & Bronwyne Andabwa. Retrieved June 16, 2025, from https://www.unido.org/sites/default/files/unido-publications/2022-12/Plastic-value-chain-in-Kenya.pdf
14 United Nations Industrial Development Organization. (2021, November). Study on Plastic value chain in Kenya [PDF]. Prepared by Thilo Vogeler, George Warutere, Judy Chebet, Jana Brinkmann, Valerie Leisten, Stephan Löhle & Bronwyne Andabwa. Retrieved June 16, 2025, from https://www.unido.org/sites/default/files/unido-publications/2022-12/Plastic-value-chain-in-Kenya.pdf
15 Hariharan, P., Shri Sathyan, G. S., Sathyaprakash, S. V., Rinchen, K., Lokesh, R. S., Shiju, A., & Agilandeswari, K. (2025). Sustainability in packaging: From traditional packaging to biodegradable alternatives. Journal of Packaging Technology and Research, 9(3), 141–166. https://doi.org/10.1007/s41783-025-00188-3
16 Nizamuddin, S., Baloch, A. J., Chen, C., Arif, M., & Mubarak, N. M. (2024). Biobased plastics, biodegradable plastics, and compostable plastics: Biodegradation mechanism, biodegradability standards and environmental stratagem. International Biodeterioration & Biodegradation, 195, Article 105887. https://doi.org/10.1016/j.ibiod.2024.105887

GET IN TOUCH

If you have any questions about the Kenya Plastics Pact and the Kenya Plastics Flower Pact, please visit our website at https://kpp.or.ke/

or contact:
communications@kpp.or.ke
karin@sustainableinclusivebusiness.org

@KPlasticspact
Kenya Plastics Pact
Kenya Plastics Pact
Kenya Plastics Pact
Kenya Plastics Pact

Kenya Plastics Pact