Design Guidelines

Recyclability of Flexible Packaging Materials

Kenya Plastics Pact

Prepared by Kenya Plastics Pact (KPP)

2026

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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). Flexible plastic packaging items common across the Kenyan economic landscape are made from cast polypropylene (CPP), polyvinyl chloride (PVC) and biaxially oriented polypropylene (BOPP)[1].

Kenya lacks primary production of plastics, with the imported plastics comprising granulates, resins and processed plastics that extend to empty containers, films and other plastic items. However, imported plastics utilised in packaged goods are not accounted for in the country. 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

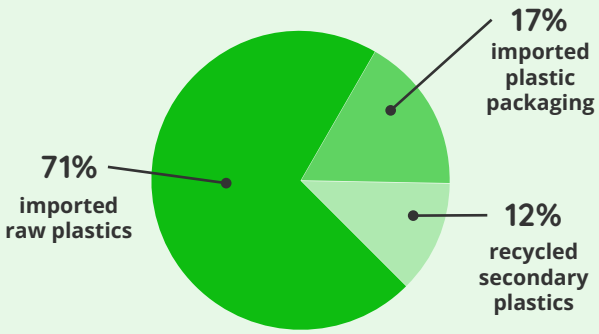
mostly from: **China • India • UAE**

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].

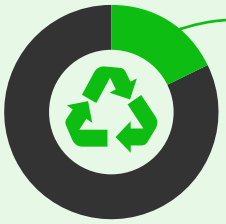
Plastic packaging consumption

259,252 total tonnes

consumed in 2019



The recycling gap



18% recycled*

— 46,988 tonnes —

82% not recycled

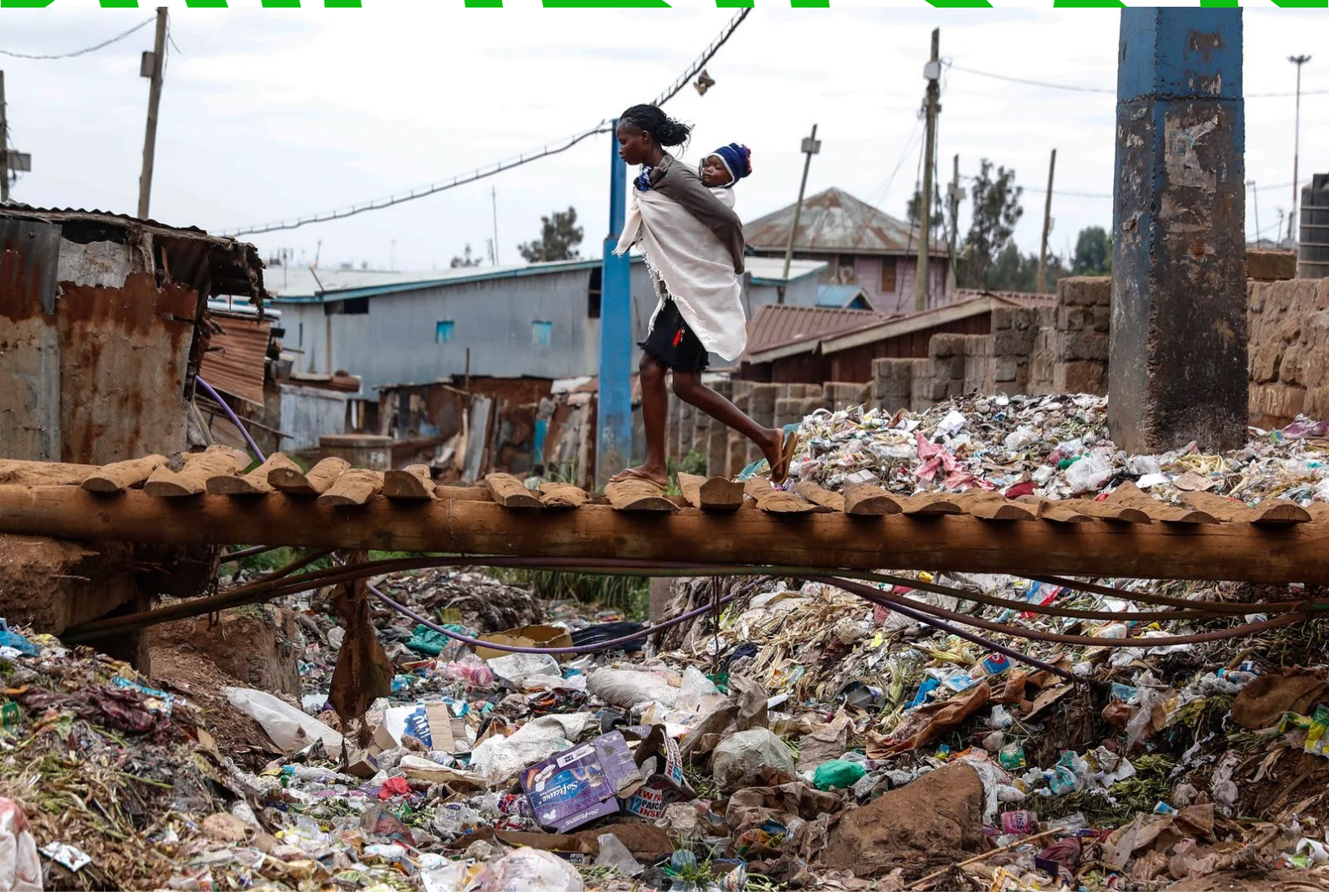
— 212,264 tonnes —

**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 the contemporary era, effective management of plastic waste (mainly through recycling) in Kenya stands out at between 3-8 per cent[10]. Table 1 illustrates the recycling rates of different plastic polymers in Kenya.

Table 1: Recycling rates of different plastic polymers in Kenya.

Plastic Type	Recycled Plastic (tonnes/year)
HDPE	10,943
LDPE	8,091
PP	6,806
PET	5,778
PVC	177
PS	0
Others	4,398

Source: Badenoch et al., 2025

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 cleaning beach from rubbish

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. The monolayered transparent flexibles recovered for the recycling process are utilised to produce construction materials such as fencing posts.

Recycling of coloured monolayer flexible is much lower due to contamination of the recyclate from different colours. 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, 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

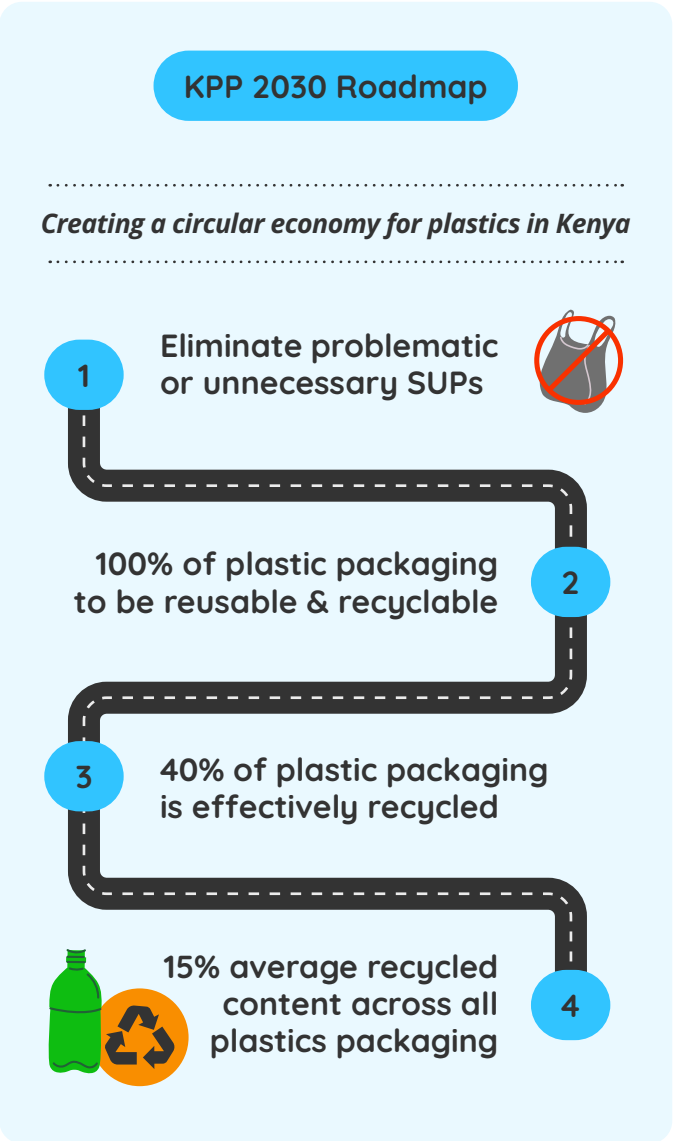
The **primary purpose of the guidelines** is to provide relevant plastic value chain actors in Kenya with **in-depth information** on mainstreaming circular approaches in the design, use and handling of flexible packaging materials.

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.

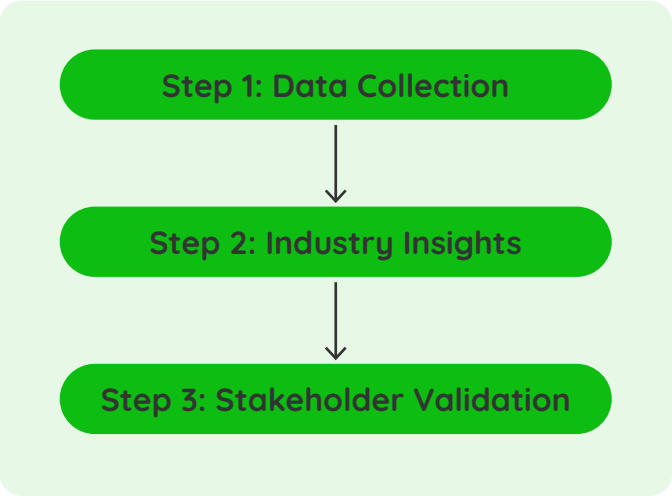
The guidelines are also grounded in international conventions, aspirations and best practices. For example, the Circular Economy for Flexible Packaging initiative (CEFLEX) presents a solid approach to increasing the collection and recycling of flexible packaging materials. Championing circularity in flexible packaging materials contributes to several Kenyan waste management policies, such as the Sustainable Waste Management Policy 2021, the Sustainable Waste Management Act 2022, 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 will be 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 will be 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.

The target audience includes:

A

Plastic packaging materials manufacturers

B

Brands and businesses

Retailers, wholesalers, producer responsibility organisations, innovators.

C

Waste service providers

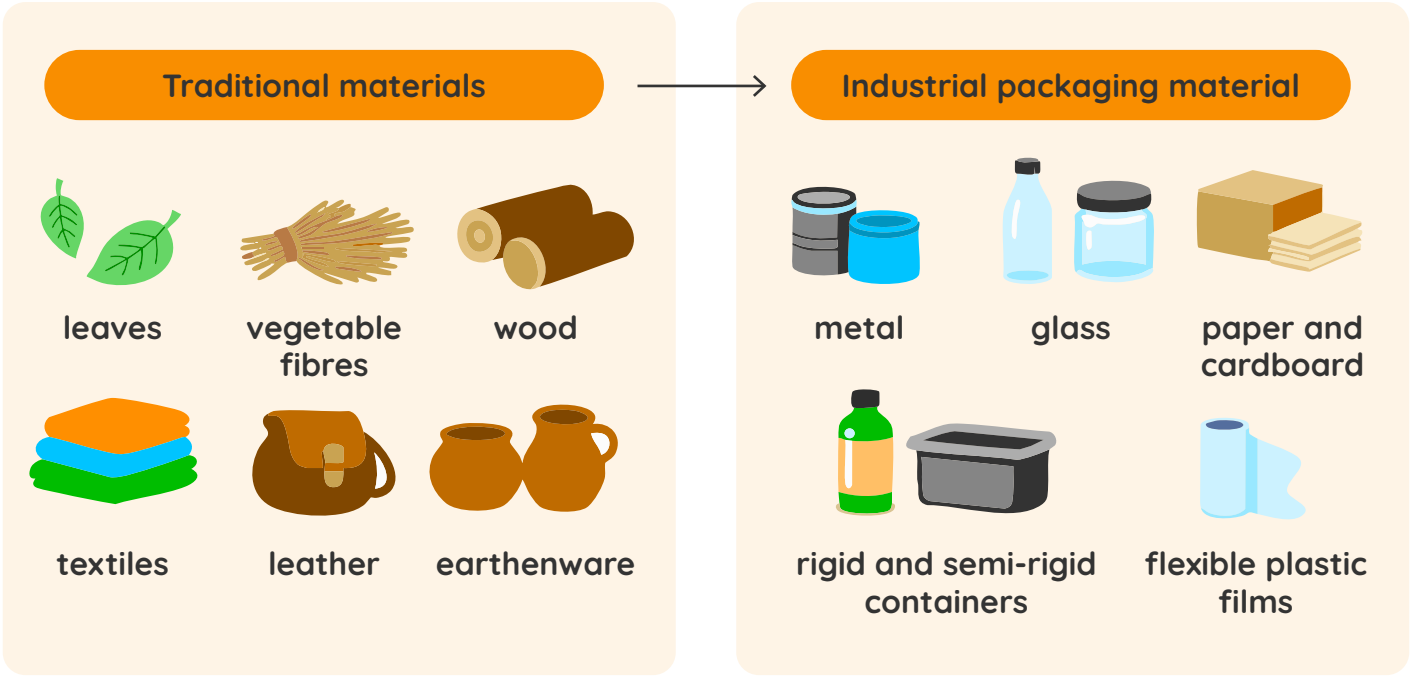
Collectors, recyclers, including informal groups.

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 several polymers. Monolayer plastic flexibles include self-sealed food storage bags, packaging wraps, pouches, etc.

2. Multilayers

Multilayer flexibles comprise packaging items with several layers, usually 3 to 20 layers of diverse plastic films, adhesive inks and other materials such as lids made from rigid plastics and metals. 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	Structure	Application	Recyclability	Remarks
LLDPE/HDPE/LLDPE	15/70/15	Grocery bags	High	All layers are polyethylene-based, compatible and widely recyclable in polyethylene streams.
HDPE/LLDPE/HDPE/EVA	30/30/30/10	Cereal liners	Moderate	Polyethylene layers are recyclable, but EVA (a non-polyolefin) can disrupt recycling if concentration is high
Paper-LDPE-ALDPE	Laminated packaging	Liquid/paste packaging (juice, milk cartons)	Low	Mixed materials (paper + plastic + aluminium) require specialized separation, rarely recyclable in curbside systems
PET/Tie/LDPE/Al/LDPE	Laminated packaging	Liquid/paste Packaging (juice, milk Cartons)	Very low	PET, LDPE, aluminium, and tie layers are incompatible without advanced delamination. Considered non-recyclable in most systems.
LLDPE-Tie-EVOHTie-LLDPE		Fresh meat	Moderate	EVOH is a barrier polymer. Small amounts with PE are manageable, but tie layers reduce compatibility.
LLDPE-Tie-PA-TieLLDPE	40/5/10/5/40	Fresh meat	Low	Polyamide (PA) and PE are incompatible; separation is challenging and limits recyclability.
LLDPE-Tie-PAEVOH-PA-TieLLDPE	30/5/10/10/10/5/30	Fresh meat	Very Low	Multilayer with incompatible polymers and high complexity. Not recyclable in standard systems.
LLDPE-HDPE-TieEVOH-Tie-HDPELLDPE	20/20/5/10/5/20/20	Processed meat	Low	Polyolefins (LLDPE, HDPE) are compatible, but EVOH and tie layers add complexity. Partial recyclability possible with advanced sorting.

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 polypropylene) bonded with a very thin layer of metal coating, mostly aluminium. Metal coating reduces moisture and oxygen content and improves the film's aesthetics. Metalised and metal-containing plastic films are generally used in the packaging of edible products, electrical appliances and electronics, and medical items.

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)

Metalised PET films with a layer of plastic and aluminium have proven effective in aroma and flavour retention in packed foods and reducing moisture and oxygen rates. Used metalised PET flexible packaging materials have proven difficult to recycle and with directed to landfills.

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

1. Complete elimination

This approach details a complete shift from using problematic and unnecessary plastic flexible packaging materials. Flexible materials such as Polyethylene Terephthalate Glycol (PETG) and PVC shrink sleeves on PET bottles are unnecessary and major environmental pollutants, as well as contaminating PET recycling.

Brands can rely on HDPE plastic bottle caps to ensure a high-level seal of their packaged food products and sensitize consumers to additional measures, such as a clicking sound from the tear when opening the bottle, as proof that the product is fit for consumption.

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.

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

Circular Approaches in post-consumer management of plastic flexible packaging materials

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:** A collective campaign led by plastic packaging item manufacturers, brands, and WSPs to raise consumers' awareness of the benefits of waste sorting will likely contribute to increased recovery and recycling rates of plastic flexibles. 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 recyclate's low market value by encouraging businesses to opt for alternatives, low collection and recycling rates, material complexities and contamination risks. 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

Metalised and metal foil films, e.g, 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 with wood pulp as the primary material. • Uncoated bags with plastics and wax	• 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		
• Minimal printing.	• 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		
• Main packaging surface made up of oriented and non-oriented HDPE, LDPE, LLDPE & copolymers (Ethylene vinyl acetate-EVA, Ethylene butyl acrylate-EBA, Ethylene methyl acrylate-EMA and • 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.	• Multilayered PE composite material (HDPE, LDPE) and small content of PP, • Additives but within a limit of < 0.97 g/cm3 of the base material density. • Barrier with ≤ 5% EVOH. • Metalising the base material contaminates the recyclates.	• The incorporation of non-polyolefin polymers such as PET, PVC, PS, PA and excessive fractions of polypropylene (PP) beyond specified thresholds will contaminate PE recyclates by disrupting melt compatibility, compromising mechanical properties and reducing the quality and market value of the recovered material. • 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		
• Minimal printing characterised with glazing or light colours. • Labels made from HDPE, LDPE, LLDPE and MDPE). • 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. • Closure systems, liners and valves made from PP, HDPE, LDPE, MDPE and LLDPE. • Use of PE and PP flexible closures in small quantities.	• Minimal printing using food-grade ink for batch coding and dates. • 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. • Use of large volumes of PP in closures can contaminate the recyclates.	• 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.

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

Material		
• PP is the primary material for the packaging surface. • Barrier of silicon oxide (SiOx) and aluminum oxide (Al2O3) without additional laminates/coatings • Adhesives that do not lead to a density of more than 0.97 g/cm3	• The multilayer packaging surface is made up of HDPE, LDPE, and a small content of PP and PE ≤ 10%. • 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/cm^3. • 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 40oC	• Light and translucent colours. • Labels made from wet-strength paper have minimal contamination to recyclates. • Minimal printing using food-grade ink for batch coding and dates. • Closure systems with high volumes of PP are major contaminants.	• 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 the material recovery facilities (MRFs), near-infrared 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.

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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 Inc. (2023, January 18). Kenya Flexible Packaging Market – Growth, Trends, COVID-19 Impact, and Forecasts (2023–2028).

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

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