SMEP

Sustainable Manufacturing and Environmental Pollution Programme

PLASTIC REDUCTION & MANAGEMENT SUMMARY OF RECOMMENDATIONS

A deep dive into policies and standards, including on biodegradation and compostability, to support National Management Authorities in East and West Africa

November **2024**

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This document is an extract of the Environmental Coalition on Standards (ECOS) report of the same title, providing policy and standards recommendations from the full report.

This report is part of the Sustainable Manufacturing and Environmental Pollution (SMEP) Programme, funded by UK-FCDO and implemented in partnership with UN Trade and Development (UNCTAD).

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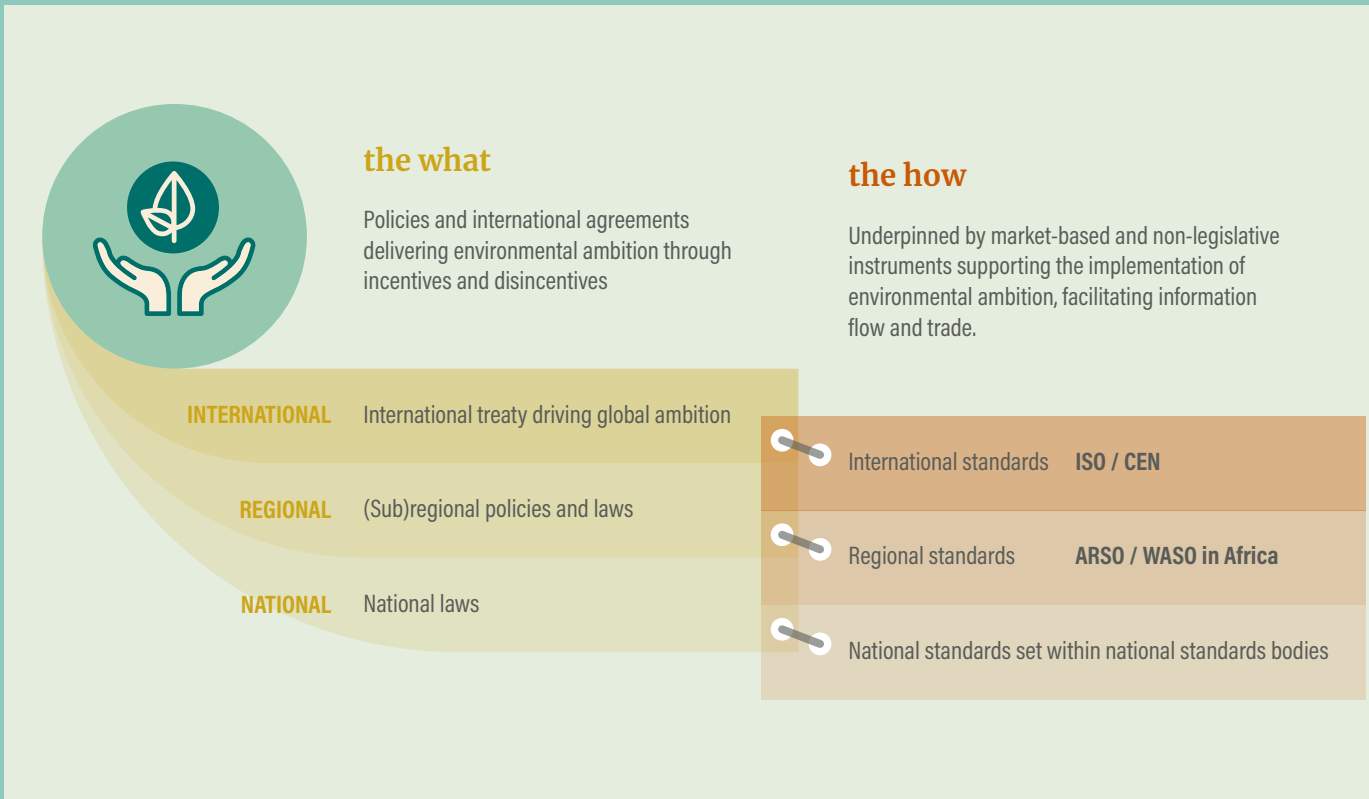
Executive Summary

This report addresses the critical need for comprehensive and effective strategies to combat the plastic pollution crisis in East and West Africa, with a particular focus on Kenya, Nigeria, and Ghana. These countries, as many others in the world, are grappling with inadequate waste management systems and the overwhelming presence of plastic waste in their environments. The report emphasizes the importance of integrating international policies and standards with national and regional frameworks to support the transition to a circular plastics economy (see Figure 1).

The issue of plastic pollution in East and West Africa is transboundary in nature, requiring a multi-faceted approach that involves collaboration at national, regional, and international levels. To effectively tackle this crisis, comprehensive policies and coordinated bans such as the proposed East African Community Single-Use Plastics (SUP) Bill and the international legally binding instrument on plastic pollution, including in the marine environment (Global Plastics Treaty) can be supported by the establishment of harmonized standards for the design, production, and disposal of plastics. The development and enforcement of these standards will facilitate a consistent framework to improve the design of plastics for reuse, recycling, composting and biodegradation, ensuring a level playing field across different jurisdictions.

↓ Figure 1. Interplay between international, regional, and national policies, laws and standards

Source: ECOS



The report's analysis focuses on the food packaging, horticulture, and forestry sectors, where single-use plastics are prevalent. It examines international, national and European standards that could be adapted for East and West Africa, such as those for compostable plastics and mulch films. The report also includes three case studies providing best practice examples of how environmental policies can be implemented in specific applications, particularly the use of standards for biodegradable agricultural mulch films in the European Union, approaches to developing natural substitutes to plastics in Ghana, and the use of certification and standards as tools to ensure the adequate use of compostable plastics in South Africa.

The shift towards alternative materials and substitutes must be approached with caution to avoid unintended negative consequences, such as the substitution of plastics with other materials which can also be harmful to the environment. Material reduction and making products reusable should be promoted as a first-line solution, while biodegradables should only be used when they provide a clear added value in specific contexts, such as in applications where reuse and recycling are not feasible.

Standards can play a pivotal role in the transition to a circular economy by providing a common language and framework for the assessment and comparison of products and technologies. They can help ensure that new solutions, such as biodegradable plastics, are thoroughly tested for their environmental performance and potential impacts on human health and the ecosystem (e.g., toxicity in soil, absence of persistent pollutants). By setting clear requirements for the certification of compostable and biodegradable products, standards can provide a reliable basis for claims made by manufacturers and facilitate informed decision-making.

The transition to new types of products must include solutions for their adequate disposal, as such it is important to establish infrastructure for the collection and management of bio-waste, such as industrial composting facilities, to ensure their proper end-of-life treatment with clear standards and communication to prevent contamination of the different waste streams (e.g. recycling and industrial composting).

In conclusion, this report provides insights and recommendations for policymakers and stakeholders in East and West Africa. It advocates for a harmonized approach that includes clear environmental regulatory guidelines, policies, and standards to support the reduction of plastic pollution and plastic waste at its source and enhance material circularity, biodegradability, and compostability. The integration of standards and best practices can significantly improve the region's capacity to manage plastic waste and reduce its environmental impact.

1.

Policy recommendations

1.1 Addressing plastics pollution at the national level

The regulatory frameworks of Kenya, Nigeria or Ghana showcase the need to reinforce policies tackling the upstream stages of the plastics lifecycle so as to prevent and reduce plastics at source, and via packaging reuse; the midstream manufacturing stage of plastics (e.g. through suitable plastic substitutes depending on the application), and the downstream stage to improve plastic waste management. Addressing plastic pollution with downstream solutions only (e.g. recycling, compostability, biodegradability) will not be sufficient on their own. Limits need to be placed on production and consumption to reduce the mounting pressure on natural ecosystems and human health.

Further coherence and coordination of policies and laws across the plastic lifecycle can accelerate plastic reduction and pollution management. By designing systems that reduce resource use, prolong product lifespans, and promote reuse and repair, the circular economy (with clear targets), offers part of the solution for reducing material footprints. We suggest below a set of recommendations adapted to the situations of Kenya, Nigeria and Ghana:

1. **Adopt national-level circularity targets:** establish clear targets to encourage sustainable practices, guide policymaking, and attract private sector investment, while providing for public participation and reasonable notice period to allow for coordinated transitions. We recommend national lawmakers to adopt specific targets for each of the following circularity aspects, following the waste hierarchy:

    a. **Targets to reduce the production, trade and use of plastics,** such as plastic production and import reduction targets, and sector-specific targets to reduce the use of plastics (including in the food sector, agriculture, forestry). Apply the waste hierarchy principles to all types of plastics regardless of the feedstock, thus ensuring that material use is first and foremost reduced and that products are then reusable and recyclable;

    b. **Targets to replace single-use products with reusable alternatives,** for instance by increasing the share of reusable packaging, bottles and cutlery used in the food sector;

    c. **Targets to replace the use of plastics with materials that are natural, waste-based, biodegradable and locally/regionally available,** such as leaves and other plant material; and

    d. **Targets to increase the share of bio-waste collected separately for industrial composting including from the food, horticultural and forestry sectors,** supported by the use of industrially compostable bags where they are shown to help separate collection and composting.

Targets must then be supported by measures which contribute to their achievement, such as the policy tools recommended below.

2. **Curtail the unsustainable growth of fossil plastics usage and waste generation:** following the leadership of regional initiatives such as the proposed East African Community Single Use Plastics Bill, we recommend:

   a. **Bans or phase-outs on unrecyclable,** hard-to-recycle and highly polluting plastics, including oxo-degradable plastics; and

   b. **Financial measures to reduce the trade of avoidable plastics,** such as taxes and import duties.

   Problematic and avoidable plastics often include single-use grocery bags and secondary or tertiary packaging with plastic wraps as well as beverage and food packs and cutlery in on-premises consumption channels (hotels, restaurants, and cafes, etc.).

Measures should be implemented against a realistic impact assessment, and their implementation should be foreseeable for businesses and citizens to help minimise unintended negative effects such as regrettable substitutions, trade effects which do not ultimately contribute to reducing overall plastic pollution, and social impacts. This means ensuring the availability at commercial scale of the identified substitute materials and reuse systems.

3. **Enact and implement Extended Producer Responsibility (EPR) Schemes:** enforce EPR regulations to hold producers accountable, attract private finance, and promote sustainable consumption with mandatory eco-modulation of EPR fees for plastics with annual recovery and recycling targets based on a company's put-on-market plastic volumes.

4. **Incentivise reuse business models:** support reuse models in the food sector through tax incentives and consumer awareness, and developing a systems thinking to deploy efficient and affordable refill systems, including for the 'kadogo economy'[1], while supporting consumers' adoption through awareness raising.

5. **Support investments in research and innovation:** encourage local research and development for reusable and recyclable designs that support the higher tiers of the circular economy, providing incentives for sustainable practices, as well as natural and locally available biodegradable substitutes with lower life-cycle impacts than conventional plastics considering the countries' natural resources.

   Substitutes, including biodegradable and compostable plastic alternatives, should not compromise food security of base crops (roots, tubers, cereals, and fruits). Public and private research bodies such as universities and specialised institutions can be leveraged to create bespoke solutions in the food sector, horticulture and forestry. When demonstrated as effective, innovations can then be standardised in order to scale up their use and benefits.

Where research and innovation has demonstrated the availability, affordability, environmental added value and absence of detrimental effects of relevant alternatives:

6. **Provide a clear and consistent framework for biodegradable and compostable alternatives to conventional plastics:**

   a. **Develop stringent criteria specifying applications for which biodegradable or industrially compostable plastics can be used,** based on proven unfeasibility of reusable or natural substitutes to be used;

   b. **Set minimum requirements on the biodegradability or compostability of relevant alternatives to plastics,** whether they are made of plastic or not, such that they are accepted and treated in existing composting infrastructure within composting time frames and practices;

1 The 'kadogo economy' is the sale of fast-moving consumer goods in tiny portions prevalent in low-income areas. It has led to various food and nonfood commodities, for example, instant coffee, margarine, tea leaves, snacks, and candy, being packaged in small portions of single-use plastic wrappers that have very high littering potential posing huge difficulties to their collection.

c. **Provide clear definitions to ensure the definite identification of product characteristics,** such as reusability, recyclability, compostability, and biodegradability. These definitions will support regulatory implementation and enforcement, marketing claims and consumer understanding. This report provides a set of recommended definitions which can be adopted from existing international standards (e.g. ISO 17088:2021 and ISO 16559:2022), European standards (e.g. EN 17427:2022) and laws (e.g. the European Single-Use Plastic Directive (EU) 2019/904); and

d. **Support the implementation of regulatory requirements by mandating the use of robust standards to test biodegradability or compostability of the plastics, depending on the environment in which the product might end up.** Where robust standards are missing, governments can request the development of new standards from national, regional or international standardisation bodies, detailing the necessary technical characteristics of the standard.

   In line with our recommendations on *Relevant standards on biodegradation and compostability* [2], we particularly recommend the adoption of ambitious international standards at national or regional level, or the development of national/regional standards for:

   - Non-plastic substitutes such as products or wastes originating from agriculture, horticulture and forestry, e.g. coconut coir for use as mulch, leaves used as packaging, bamboo stems used as seedling tubes, cotton tote bags, etc. Standards can be used to assess the soil biodegradability and performance using these substitutes, as well as their impacts on soil conditions, plant productivity, food safety, and other relevant areas of impacts (e.g. based on ISO 23517:2021);
   - Plastics biodegradable in soil (e.g. ISO 23517:2021 on soil biodegradable plastics materials for mulch films in agriculture and horticulture);
   - Plastics biodegradable in soil for forestry applications; and
   - Compostable packaging typically mixed with bio-waste in food applications (e.g. ISO 17088:2021 on industrially compostable plastics, if separate collection and composting infrastructures are available, or EN 17427:2022 on carrier bags suitable for treatment in well-managed home composting installations), while ensuring clear differentiation through labelling systems for consumers.

Biodegradation should be tested and determined for all separate constituents of a product and for the final product as a whole. For the limited industrially compostable plastics that should be allowed, it remains important to ensure their full and harmless composting in industrial composting facilities, tested realistically and demonstrated for **their ultimate aerobic biodegradation, disintegration and non-toxicity.** It is also important to consider that colorants, additives, printing inks and glues can influence the results of biodegradation, disintegration and ecotoxicity tests.

Laws and standards should ensure clear product labelling (e.g. ISO 14021:2016, *Environmental labels and declarations – Self-declared environmental claims*, is being revised), particularly regarding the adequate disposal of the product (reuse, recycling or composting), and exclude detrimental alternatives or alternatives that have worse impacts than conventional plastics over the entire lifecycle. This is the case for oxo-degradable plastics that do not properly biodegrade and contribute to microplastic pollution (Eunomia Research & Consulting, 2016; Miles, 2017).

2 See full ECOS report of the same name.

Effective coordination between national authorities and national/regional standardisation bodies is required to ensure that standards effectively support policies and regulations to achieve circular economy goals.

Voluntary standards often reflect disproportionate influence from industry stakeholders, leaving limited room for input from critical groups such as environmental agencies, scientists, small businesses, trade unions, and consumers. Governmental and standardisation bodies should ensure inclusivity in standardisation processes, allowing relevant and affected stakeholders to intervene alongside industry and government actors.

Based on a well-informed selection of demonstrably effective alternative solutions to conventional plastics, the following measures should be taken:

7. **Upgrade and expand solid waste management infrastructure:** enhance segregated waste collection – especially of bio-waste – sorting, optimise value recovery of plastics and other recyclables by leveraging private and public funding, with joint efforts between local governments and recognition of informal waste pickers to minimise waste to dumpsites.

8. **Extend plastic control measures beyond packaging and consumer goods products:** define plastic waste prevention, reduction and recycling regulations and targets to specific sectors such as agriculture, horticulture, forestry, fishing, construction, textiles, etc. where indiscriminate use of plastics and resultant pollution are equally damaging to the environment.

9. **Run awareness campaigns and consumer education programmes:** educational campaigns and clear labelling in local languages needs to inform consumers about the negative health and environmental impacts of plastics, reusable alternatives to single-use plastics, and proper disposal methods for biodegradable and compostable plastics, especially women as behavioural change champions (Global Plastic Action Partnership, 2021).

10. **Develop supportive green public procurement policies:** mandate public sector purchasing and use of reusable and recyclable solutions, but also natural substitutes and biodegradable products to substitute single-use non-biodegradable food packaging, public horticultural or forestry projects, where there is a clear environmental added-value.

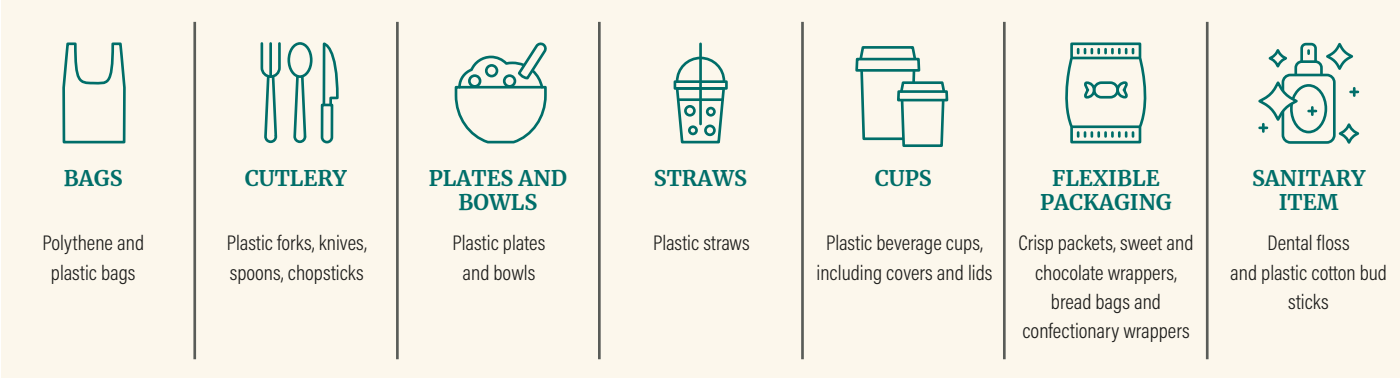
1.2 Towards an effective East African Community Single-Use Plastics Bill

A key initiative of the EAC is a proposed Bill on the prohibition of manufacturing, importation, use and sale of single use plastics (SUP Bill), to be considered by the East African Legislative Assembly in 2024. The SUP Bill presents a unique opportunity to harmonise national legal frameworks on regulating single-use plastics across East Africa, offering a solution to the problem of transboundary trade of single use plastics and associated pollution.

The scope of the proposed SUP Bill includes a list of single-use plastics for which alternatives exist, including:

↓ Figure 2. Types of SUP items included in the EAC's proposed SUP Bill with available alternatives

Source: ECOS



These plastics are commonly found in beach cleanups and were for the most part also subject to a ban in other regions, such as in the European Union with the Single Use Plastics Directive.

Key elements of the draft SUP Bill which must be maintained and should be effectively implemented by the EAC Member States include:

- The definition of 'problematic plastics', defined as plastic packaging items, components or materials for which alternatives exist and consumption should therefore be eliminated and replaced with reusable products, or with products made of more environmentally-friendly materials;
- The prohibition of production, import, sale and use of problematic plastics, including the full list of prohibited single-use plastics;
- Clear penalties and enforcement measures on these prohibitions;
- A mandate for governments to develop waste management system and preventing dumping;
- Measures towards a smooth and equitable transition away from using SUPs;
- Measures to recognise the role of informal waste pickers and improve their welfare;
- A mandate for the allocation of EPR fees to improving infrastructure and supporting the informal waste sector workers;
- Measures for governments to raise awareness and educate citizens about the new rules and the use of alternatives to plastics; and
- Provisions for the clear marking of products containing plastic, their appropriate disposal route, the prevention of littering and inappropriate disposal, and the negative environmental and health impacts from plastic litter.

We highly recommend the East African Legislative Assembly to adopt the proposed SUP Bill with those elements. Furthermore, we recommend the EAC Member States to improve the proposed Bill and its implementation by:

- Clarifying which products are to be exempted in the list of permitted single-use plastics in order to prevent loopholes. In particular, some plastics under 'industrial purposes' and 'agriculture and forestry' could be classifiable as problematic according to the definition and should be phased out (e.g. plastic mulch films which can be replaced with natural substitutes);
- Setting clear timelines for the achievement of goals, including on bans, in order to allow for an effective transition away from single-use plastics;
- Allocating technical and financial support for the implementation of the SUP framework, including for adequate waste infrastructure, enforcement and education;
- Establishing monitoring and reporting structures that track progress and ensure compliance; and
- Giving manufacturers the responsibility to also educate their staff and the consumer population about the new rules and the meaning of labels.

1.3 Towards a robust Global Plastics Treaty

The ongoing intergovernmental negotiations (INC) on an international legally binding instrument on plastic pollution, including in the marine environment present a pivotal opportunity to address plastic pollution, a pressing global issue with pronounced impacts on Africa. Given the transboundary nature of plastic waste, international cooperation is essential as no single nation can effectively tackle the problem in isolation. The African Group (AF) has taken a leadership role in advocating for a legally binding, ambitious instrument aimed at addressing the root causes of plastic pollution.

The AF has consistently championed an approach based on the waste hierarchy, emphasising waste prevention and reduction over non-toxic recycling and disposal. Their proposals include product design requirements, the elimination of problematic polymers, chemicals, products, and applications of concern, and the implementation of mandatory EPR schemes. The AF has also highlighted the urgent need to combat illegal plastic waste dumping in Africa and called for measures that ensure transparency and information disclosure along the entire plastic value chain. Moreover, the AF has been a strong supporter of intersessional work to advance the development of criteria to identify chemicals of concern, problematic, and avoidable plastics and product design (African Group, 2024; African Group, n.d.).

The AF's efforts have been commendable in driving the treaty negotiations forward, laying a strong foundation for a comprehensive and effective global agreement. Building on these achievements, we have developed a set of recommendations that support and strengthen their approach, ensuring the treaty is fit for purpose and capable of addressing the full scale of the plastic pollution crisis.

As negotiations progress, it is essential that the following priorities are addressed at INC-5 to guarantee the treaty's success:

1.3.1 Support global binding rules

The strength of any global treaty lies in its ability to enforce common standards across all signatories through binding rules. Without such rules, it is projected that mismanaged plastic volumes could double by 2040 (WWF, 2022). **A binding framework that covers the entire lifecycle of plastics is essential to the effectiveness of the treaty**. The success of the Montreal

Protocol, which achieved a 98% reduction in ozone-depleting substances through a global ban, demonstrates the power of binding global agreements over voluntary measures (UNEP, 2019). The AF should leverage its leadership position to advocate for binding rules for all treaty provisions.

1.3.2 Reduction in plastic production

Global plastic production is forecast to nearly triple by 2060, far outpacing current waste management capacities (OECD, 2022). Addressing this requires the treaty to include binding rules that specifically target reductions in plastic production. Key measures include:

a. Targets to **phase down plastic production**, with emphasis on primary production;

b. **Inclusion of feedstock and precursors in the treaty's scope**;

c. Provisions to **eliminate products containing problematic, avoidable, and unnecessary plastics**, including microplastics, single-use, and short-lived plastics;

d. Rules to **ensure systematic application of the waste hierarchy, circular economy principles, and life cycle assessment** when designing, producing, using, and disposing of plastic products;

e. Rules to **prioritise and establish reuse systems**;

f. **Harmonised extended producer responsibility** (EPR) principles and clear rules for implementation;

g. Rules and targets to **increase high quality recycling;** and

h. Rules around **environmental claims for plastic products**, i.e. recycled content, compostability, biodegradability.

1.3.3 Avoidance of regrettable substitutions

As discussed in this report's section on *The use of alternative designs and materials*, alternative plastics and non-plastic substitutes can also play a role in reducing plastic waste globally, but their use must be carefully managed to avoid negative environmental trade-offs. To prevent negative environmental externalities, the treaty should incorporate binding rules on the sustainable use of alternative plastics and non-plastic substitutes, including:

a. Rules to **prevent the substitution of single-use plastics with other single-use products**, e.g. alternative plastics or non-plastic substitutes;

b. **Rules and guidance to ensure the application of the waste hierarchy**, circular economy principles, and comparative life cycle assessments when considering alternative plastics or non-plastic substitutes;

c. Rules around **environmental claims on alternative plastics**, e.g. biobased or biodegradable and non-plastic substitutes, e.g. carbon neutral; and

d. Rules and **standards for compostable or biodegradable plastics**, following this report's recommendations for an effective African standardisation framework on biodegradation and composting.

1.3.4 Appropriate use of standards

Several provisions in the current treaty draft emphasise the development of global voluntary standards. **To ensure that standards align with the treaty's goals, they should be overseen by the treaty's governing body in the following way**:

a. The treaty's governing body, or a subsidiary body designated by the governing body, should set technical measures and minimum performance criteria for systems enabling the reusability, refillability, and recyclability of plastics and plastic products;

b. Parties to the treaty must adopt standards that meet the technical measures and minimum performance criteria established by the governing body;

c. The development of these standards should involve equitable participation from all impacted communities and sectors, including small businesses, formal and informal workers, consumers, and environmental and public health experts; and

d. The governing body should establish a committee to oversee the global harmonisation and maintenance of reuse, refill, and recycling standards. This body should also facilitate capacity-building for the development and implementation of these standards worldwide, drawing on similar efforts in other multilateral environmental agreements, such as the International Plant Protection Convention and the Montreal Protocol's Standardisation Taskforce.

1.3.5 Ensure transparency

Transparency is a critical element of effective governance and accountability in the plastics treaty. It is essential to ensure that all stakeholders, including signatories and large corporations, adhere to transparent reporting practices across the entire plastic lifecycle. Key recommendations include:

a. Mandatory **standardised reporting requirements** for chemicals, plastic materials, and plastic products throughout their lifecycle. At a minimum, parties should report:

- Progress on their contributions to national and global targets to phase down plastic production;
- Country-level data on annual production, imports and exports of primary polymers; and
- Complete information about environmental and health impacts, and safe use, reuse and disposal of chemicals and polymers of concern.

b. Establish **mandatory globally harmonised transparency, traceability and labelling systems for the chemical composition of plastic materials and products** (HEj, 2024). The transparency system shall define the reporting format and requirements. The traceability systems shall set guidelines for the development of labelling systems.

c. Establish a **global database for management of transparency and traceability for chemical composition data** of plastic materials and products.

d. Establish a **multistakeholder science-policy subsidiary body** to ensure a two-way science and policy interaction in policy- and decision-making for implementing and evaluating the treaty.

e. Create an accountability mechanism to track and enforce compliance with treaty provisions.

2.

Recommendations for an effective African standardisation framework on biodegradation and composting

Based on the assessment of available standard specifications on industrial composting, home composting and biodegradability in soil, the following standard specifications allow for ensuring better biodegradation and non-toxicity criteria in their standards requirements, and could be considered by the national authorities of Kenya, Nigeria and Ghana and their national standardization bodies KEBS, SON and GSA:

← Figure 3. Standard specifications for better biodegradation and non-toxicity in food packaging, agriculture, horticulture, and forestry applications

** On the condition that industrial composting plants are operational and accept compostable food packaging, including plastics, as input material.*

Nevertheless, **industrial composting conditions cannot be fulfilled when waste is not properly collected with bio-waste for industrial composting and ends up in landfills (e.g. in Kenya), or is not well-managed in a home compost.** Composting processes are best ensured under the following conditions:

- For industrial composting, the bio-waste must be separately collected and subsequently treated in industrial composting facilities. If bio-waste collection systems and/or industrial composting facilities do not exist yet, industrial composting is not an option;
- For home composting, it is important to carry out education and awareness raising campaigns towards households on how it should be performed (e.g. when buying a home composting unit). If home composting is not well managed the process will be sub-optimal and the biodegradation/disintegration of home compostable materials, particularly plastics, might be delayed; and
- When ending up in landfills, soil biodegradable products may not biodegrade in practice. This is due to that fact that the conditions of landfilling (i.e. anaerobic) are not the same as in soil (i.e. aerobic and a lot of bacteria and fungi). Some polymers biodegrade under aerobic conditions, but not under anaerobic conditions.

Regional harmonisation of these standards should be promoted in the East African Standards Committee (EASC), the West African Standardisation Organisation (WASO), and the African Organisation for Standardisation (ARSO) to improve regional coherence and to reduce Technical Barriers to Trade, such as through:

1. Clear and harmonised definitions: establish consistent definitions for biodegradable, compostable, and conventional plastics across the countries' regulatory frameworks to improve clarity, in coherence with state-of-the-art international standards (see Recommended definitions, such as composting, organic recycling and ultimate aerobic biodegradation). These are also essential for related certification and labelling schemes to show consistency in both business-to-business and business-to-consumers communications.

2. Adopt international standards for biodegradable and compostable plastics where consistent with local circumstances: adopt the relevant and most recent international standards, ideally at regional level, to stimulate market awareness and interest in these products, foster trade, and attract pilot investments in their value chain development for applications where there is a clear added-value, considering the countries' environmental conditions and available natural substitutes to plastics. Two examples of standards are ISO 23517:2021 on soil biodegradable plastics for mulch films in agriculture and horticulture and ISO 17088:2021 on plastics suitable for industrial composting, this latter which can only be effective if bio-waste is separately collected and subsequently treated in industrial composting facilities (e.g. the 2012 version of ISO 17088 has been adopted nationally by KEBS, and the revised 2021 version of ISO 17088 should be adopted nationally too, but industrial composting is not widely available in Kenya).

   Such standards can also be referenced in national regulation, legislation or policies (ISO, 2024), as well as in national strategies to support high-level policy targets. They can help verify and test whether a product complies with the relevant national and/or regional rules and regulations. Relying on such internationally agreed good practices can allow regulators to save resources, especially where national capacity might not fully be developed yet, and facilitate trade. It is then important to reference the standard publication year in national regulation, legislation or policies.

3. Targeted applications: issue recommendations on the use of the relevant biodegradable and compostable plastics standards in the selected sectors, considering the available waste management infrastructures, natural substitutes and their impacts to avoid detrimental substitutions.

4. Conformity assessment: empower conformity assessment bodies and services to verify the environmental and performance criteria of biodegradable and compostable plastics, and their natural substitutes.

3.

Recommended definitions

The following list of recommended definitions has been developed based on our assessment of the most appropriate definitions in state-of-the-art standards, especially ISO standards (whose definitions are publicly available on ISO Online Browsing Platform) and CEN standards, as well as ambitious legislation relating to single-use plastics, looking at the European Union's legal framework. We have nevertheless not listed any definition of 'bioplastics' or 'biopolymers', which leave the door open to misunderstandings and inappropriate use to characterise bio-based plastics, biodegradable plastics or both.

Terminology	Definition
bio-based product	product wholly or partly derived from biomass ▶ the bio-based product is typically characterised by the bio-based carbon content or the bio-based content *Source: ISO 16559:2022, 3.25*
bio-waste	biodegradable garden and park waste, food and kitchen waste from households, offices, restaurants, wholesale, canteens, caterers and retail premises and comparable waste from food processing plants *Source: European Waste Framework Directive (EU) 2008/98/EC, 3.4*
community composting	controlled waste treatment process of organic waste collected from small neighbourhood or produced by centralised sources (e.g. hospitals, canteens, restaurants) usually at a scale bigger than home composting and smaller than industrial composting *Source: EN 17427:2022*
compostable plastic	plastic that undergoes degradation by biological processes during composting to yield CO2, water, inorganic compounds and biomass at a rate consistent with other known compostable materials and leave no visible, distinguishable or toxic residue ▶ "Hazardous" is used synonymously to "toxic" *Source: ISO 17088:2021, 3.2*
composting	aerobic process designed to produce compost starting from biodegradable waste ▶ Composting is classified into industrial composting, home composting and worm composting *Source: ISO 17088:2021, 3.3*
disintegration	physical breakdown of a material into very small fragments *Source: ISO 17088:2021, 3.4*
home composting	composting process performed by private individuals with the aim of producing compost for their own use *Source: EN 17427:2022*

Terminology	Definition
home compostable packaging	packaging that can biodegrade in non-controlled conditions that are not industrial scale composting facilities and the composting process of which is performed by private individuals with the aim of producing compost for their own use *Source: European Packaging and Packaging Waste Regulation, 2024, article 3.42, publication pending*
industrial composting	composting process performed under controlled conditions on industrial scale with the aim of producing compost for the market ► In some regions industrial composting is referred to as professional composting ► Industrial composting does not hinder or jeopardise the separate collection and the composting or anaerobic digestion process *Source: ISO 17088:2021, 3.13, modified – Note 2 added based on the European Packaging and Packaging Waste Regulation, 2024, article 3.41*
laboratory scale composting	aerobic process designed to produce compost at laboratory scale under environmental conditions simulating those experienced in an industrial compost pile *Source: ISO 20200:2023, 3.4*
organic constituent	chemical constituent that contains carbon covalently linked to other carbon atoms and to other elements, most commonly hydrogen, oxygen or nitrogen ► Inorganic carbonates, carbides, cyanides and simple oxides such as carbon monoxide and carbon dioxide are not classified as organic constituent ► Allotropes of carbon, such as diamond, graphite, carbon black, fullerenes, and carbon nanotubes are also not regarded as organic constituent *Source: EN 17427:2022*
organic recycling	aerobic (composting) or anaerobic (digestion) treatment of plastics waste under controlled conditions using micro-organisms to produce, in the presence of oxygen, stabilised organic residues (compost), carbon dioxide and water or, in the absence of oxygen, stabilised organic residues (compost), methane and carbon dioxide ► The term "biological recycling" is used synonymously *Source: ISO 17088:2021, 3.6*
oxo-degradable plastics	plastic materials that include additives which, through oxidation, lead to the fragmentation of the plastic material into micro-fragments or to chemical decomposition ► Oxo-degradable plastics are non-biodegradable. Once oxo-degradable plastics and their fragments are buried in the soil, out of sunlight, the degradation process stops or slows significantly and persistent small plastic particles remain intact, causing the release of microplastics. The resulting microplastics are made of oxidised non-biodegradable polymers *Source: Single-Use Plastic Directive (EU) 2019/904, 3.3, Note added*

Terminology	Definition
plastics	synthetic material or modified natural material, either a polymer or combination of polymers of high molecular mass modified or compounded with additives such as fillers, plasticizers, stabilizers, flame retardants and colorants *Source: UNEP, 2023. Technical guidelines on the environmentally sound management of plastic wastes, UNEP/ CHW.16/6/Add.3/Rev.1*
recycling	any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes including the reprocessing of organic material, but excluding energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations *Source: European Waste Framework Directive (EU) 2008/98/EC, 3.17*
reusable packaging	packaging or packaging component which has been designed to accomplish or proves its ability to accomplish a minimum number of trips or rotations in a system for reuse *Source: ISO 18603:2013, 3.2*
ultimate aerobic biodegradation	breakdown of an organic compound by microorganisms in the presence of oxygen into carbon dioxide, water and mineral salts of any other elements present (mineralisation) plus new biomass *Source: ISO 17088:2021, 3.8*
volatile solid	solids obtained by subtracting the residue of a known volume of test material or compost after incineration at about 550 °C from the total dry solids (3.7) of the same sample ► The volatile-solids content is an indication of the amount of organic matter present *Source: ISO 17088:2021, 3.9*
well-managed industrial composting process	composting process performed under controlled conditions where the temperature, water content, aerobic conditions, carbon/ nitrogen ratio and other conditions are optimised *Source: ISO 17088:2021, 3.12*

References

Africa Group. Opening Statement – INC 4, Ottawa, Canada – April 23, 2024. Available at UNEP.

Africa Group. Proposals for Intersessional Work Prior to INC 5 (n.d.). Available at UNEP.

Environmental Coalition on Standards (ECOS). Response to Consultation on Roadmap for an EU Policy Framework for Bio-Based, Biodegradable, and Compostable Plastics (2022). Available at ECOS.

Eunomia Research & Consulting. Oxo-Degradable Plastics: Degradation, Environmental Impact, and Recycling (2016). Available at ResearchGate.

Global Plastic Action Partnership. A Roadmap for Radical Reduction of Plastic Pollution in Ghana (2021). Available at WACA Program.

HEj. Support Brief on Transparency and Traceability Systems for Plastics (2024). Available at Global Chemical Transparency.

International Organization for Standardization (ISO). ISO Policy Brief: Combatting Plastic Pollution with International Standards (2024). Available at ISO.

Miles, C. Oxo-Degradable Plastics Risk Environmental Pollution: Performance and Adoptability – Biodegradable Mulch. Report No. FA-2017-01 (2017).

Organisation for Economic Co-operation and Development (OECD). Plastics Use Projections to 2060: Global Plastics Outlook – Policy Scenarios to 2060 (2022). Available at UNEP.

United Nations Environment Programme (UNEP). Thirty Years On: What is the Montreal Protocol Doing to Protect the Ozone? (2019). Available at UNEP Story.

World Wildlife Fund (WWF). Towards a Treaty to End Plastic Pollution: Global Rules to Solve a Global Problem (2022). Available at WWF.

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