



# Plastic waste management policies in the East African Community (EAC) region: challenges and prospects

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**Abstract:** Plastic pollution is a major environmental challenge, particularly in the East African Community (EAC) region. In response to this problem, member countries have adopted various plastic waste management policies (PWMPs). Unfortunately, there are disparities between these member countries in the effective implementation of these policies, despite this legal arsenal. The objective of this study is to take a critical and in-depth look at the main WMPs implemented in the EAC countries, identifying the challenges encountered and the prospects for improvement. A comparative analysis of national legislation and EU initiatives was carried out. The data extracted was coded and subjected to qualitative analysis using MAXQDA software, based on the categories 'Policies' and 'Measures'. These categories were then broken down by country, type of measure and year of implementation. The results show notable progress, such as the revolutionary bans in Rwanda and Kenya. However, there are also notable gaps in the application of these bans and in the availability of affordable alternatives, especially in other countries in the region. The main challenges identified lie in the lack of regional coordination, limited financial resources and insufficient public awareness. However, there are also significant gaps in the enforcement of these bans and in the availability of affordable alternatives, especially in other countries in the region. The main challenges identified lie in the lack of regional coordination, limited financial resources and insufficient public awareness. On the other hand, success stories from Rwanda demonstrate the potential of integrated and participatory approaches in efforts to effectively eliminate plastic waste. To enhance the effectiveness of plastic waste management policies in the EAC, the study recommends promoting the harmonisation of legislation, investing in adequate infrastructure, building institutional capacity and encouraging the active participation of local communities. These measures would contribute to a significant reduction in plastic pollution and environmental protection in the region.

## 1. Introduction

Environmental pollution in its many forms - atmospheric, aquatic, terrestrial - is one of the major crises of the 21st century. Among these crises, pollution caused by plastic waste stands out for its scale and persistence (UNEP, 2023). Worldwide, plastic production increased from 2 million tonnes in 1950 to 380 million tonnes in 2015 (Geyer et al., 2017). This study reveals that only 9% of this quantity was

properly recycled, 12% was landfilled and 79% ended up in terrestrial and marine ecosystems, threatening biodiversity and impacting socio-economic activities. This situation is particularly alarming in developing countries, where waste management infrastructures are still inadequate. In response to this crisis, various pieces of legislation have been developed by several countries (Emembolu *et al.*, 2022; Adam *et al.*, 2020; Osarumwense *et al.*, 2020; Behuria, 2019; Dauvergne, 2018). In addition, all member countries of the East African Community (EAC) region have introduced bans, taxes and regulatory frameworks to reduce the production and consumption of single-use plastics (Behuria, 2019; Cummings & Oremo, 2023; Harris, 2021; Kairu, 2020; Kworu, 2019; Njeru, 2006).

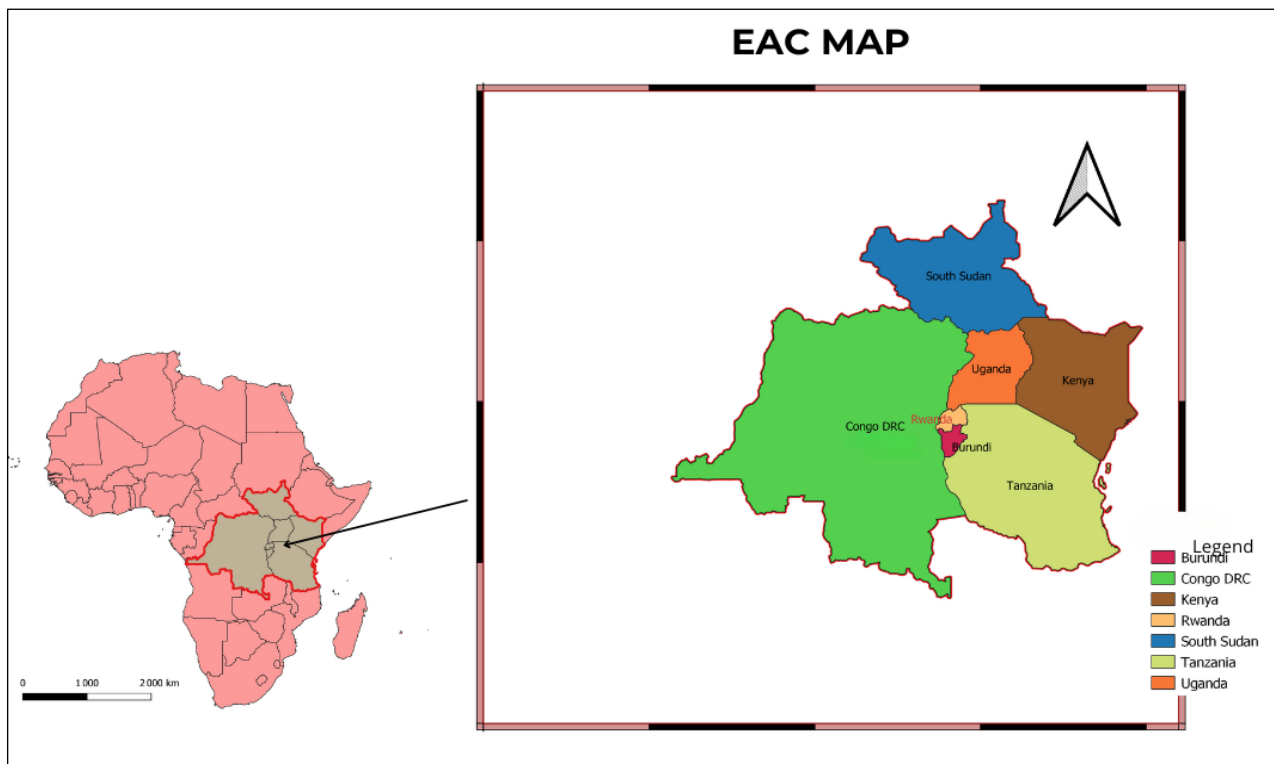
This vast region of East Africa, encompassing Burundi, Rwanda, the Democratic Republic of Congo, Tanzania, South Sudan, Kenya and Uganda, is experiencing rapid demographic growth and some of the fastest urbanisation in the world (Harris, 2021; Nakei *et al.*, 2022). In 2022, its population totalled more than 300 million (EAC, 2022). This dynamic is leading to a steady increase in the generation of plastic waste, which is accumulating in the environment, with devastating effects on human health, the economy and marine ecosystems (UNEP, 2023). Since the 2000s, these countries have gradually adopted a series of policies and regulations aimed at limiting the use and uncontrolled disposal of single-use plastics and improving their management (Behuria, 2021; Enge, 2018). However, despite these initiatives, plastic pollution remains problematic, hampered by numerous socio-economic, operational and behavioural challenges (Behuria, 2018, 2019; Mugisha & Diiro, 2015), such as the lack of affordable alternatives, inadequate collection and recycling infrastructure, and the persistence of ingrained consumption habits (Enge, 2018; IUCN Quantis, 2021). Previous studies on plastic waste management in East Africa have mainly focused on isolated national analyses, notably in Rwanda (Behuria, 2021) and Kenya (Cummings & Oremo, 2023). While this work has provided valuable insights, it offers only a fragmented understanding of regional dynamics. Comparative research in West Africa (Nyathi & Togo, 2020) and North and Latin America (Xanthos & Walker, 2017) has demonstrated the importance of an integrated regional approach. The work of Homonoff (2018), in certain US cities, revealed a psychological effect of financial incentives (taxes or bonuses) on reducing the use of single-use plastic bags. The study by Bi *et al.* (2024) showed the challenges of policies implemented in the ASEAN (Association of Southeast Asian Nations) region and the strategies needed to curb plastic pollution. This research in other regions highlights the need for a similar analysis for the EAC. The overall aim of this study is to fill these gaps by systematically and critically examining the effectiveness of the policies put in place by each EAC country to combat plastic pollution, while identifying the challenges faced and the prospects for improvement.

The methodology used is based on a qualitative approach based on a literature review of national and regional regulatory frameworks in the ACE. The main bibliographic databases (Web of Science, Scopus, ScienceDirect) and search engines (Google Scholar, Semantic Scholar, etc) were explored using relevant keywords. This research is distinguished by its holistic approach, integrating the socio-economic, institutional and environmental dimensions specific to the region. More specifically, this research has the following specific objectives: (i) to draw up an inventory of the regulatory frameworks, programmes and measures adopted by each country in terms of plastic waste management, (ii) to assess their strengths, weaknesses and the challenges encountered in their implementation, with regard to the specific socio-economic, geographical and climatic contexts, (iii) to identify the key success factors and good practices that have enabled significant progress to be made, (iv) to formulate pragmatic recommendations tailored to local realities, with a view to optimising the relevance, effectiveness and

sustainability of these policies at regional level. The analysis will be based on the following hypotheses: shortcomings in the effective application and rigorous monitoring of existing regulations are a major brake on their impact (H1); the lack of economically viable and socially acceptable alternatives to plastic products is considerably slowing down the transition to more sustainable consumption patterns (H2); a harmonised regional approach, combined with coordinated efforts to raise awareness among the public and economic players, would make it possible to overcome the current obstacles more effectively (H3). By conducting an in-depth critical and comparative analysis of these environmental policies, this study aims to enlighten public decision-makers and all stakeholders, in order to encourage the concerted adoption of measures adapted to local realities to curb the scourge of plastic pollution in the EAC region in the long term. This research is also an academic contribution in the current context of growing awareness of the urgent need to curb plastic pollution on a global scale.

## 2. Methodological approach

A systematic methodological approach was adopted to carry out this critical review of plastic waste policies in EAC member countries (Figure 1), described through existing literature.



**Figure 1:** Map of the EAC region in green (adapted from OCHA data)

Major bibliographic databases such as Web of Science, Scopus and ScienceDirect have been systematically searched (Chigbu et al., 2023). In parallel, leading academic search engines such as Google Scholar, Semantic Scholar, Scinapse and SciSpace were also thoroughly explored. Once this final corpus of sources had been established, a crucial phase of systematic data extraction was implemented. Source inclusion criteria included peer-reviewed scientific publications, reports published by global entities and authoritative government articles, relating to plastic waste management policies in the ECA region. Search terms used in the databases included keywords such as "plastic waste", "policies", "East Africa", "EAC", "waste management", "plastic ban", "recycling"

and "circular economy". Data analysis was carried out using MAXQDA software (Gizzi & Rädiker, 2021) using a thematic coding methodology. Two main classifications were established, namely "Policies" and "Measures", accompanied by sub-classifications delimiting each country, the nature of the measure (whether preventive or curative) and the year of implementation. The review facilitated the identification of predominant models and points of convergence and disparity between policies in different countries. We believe that this methodology guarantees the reliability, objectivity and completeness of the results presented in this systematic review of policies within the East African Community.

### 3. Genesis of plastic waste management policies (PGDP) in the EAC region

Faced with the scale of the challenge posed by plastic pollution, EAC countries have gradually adopted various policies and legislation in an attempt to curb the problem (Danielsson, Wockelberg and Kall, 2017; Mihigo, 2018; Behuria, 2019a, 2019b, 2021; Kwori, 2019; Hakuzimana, 2021; UNEP, 2020). Figure 2 shows a timeline tracing the key stages in the introduction of legislation to ban or reduce the use of single-use plastic bags and packaging in various East African countries.

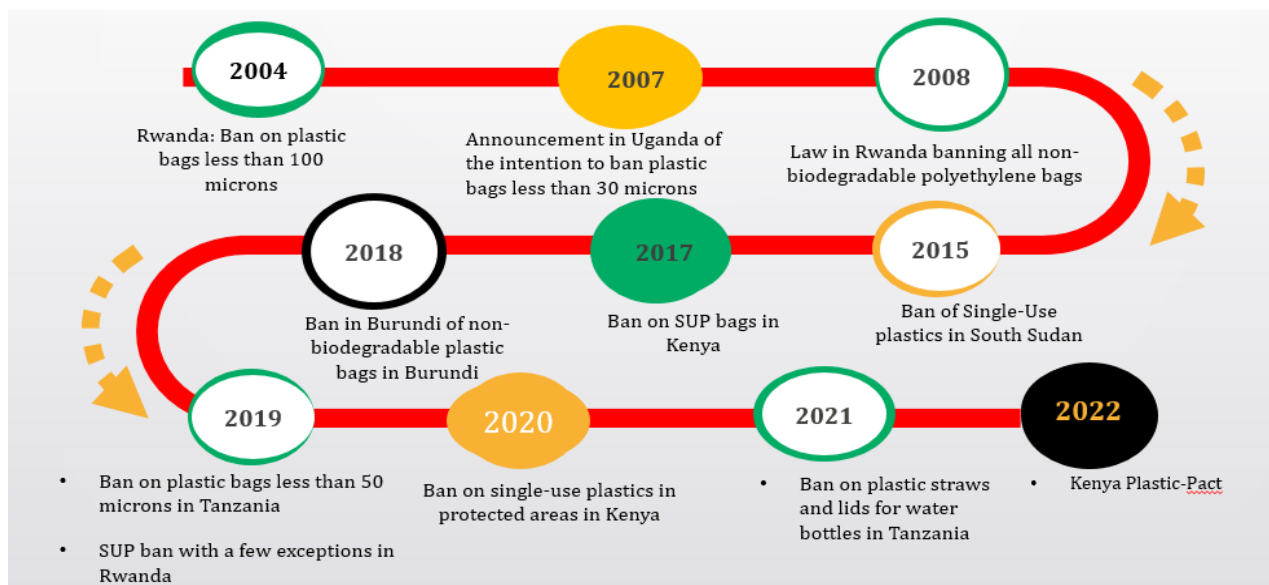


Figure 2: Timeline of the main actions against plastic waste in EAC

Rwanda was the forerunner as early as 2003, followed by other nations such as Burundi, Tanzania, Kenya and the Democratic Republic of Congo, which gradually strengthened their legal frameworks. This chronology highlights the different approaches adopted by different countries, some of which banned most single-use plastics from the outset, while others proceeded in successive stages. Let's take a closer look at each country's regulatory framework.

#### 3.1. Rwanda

Rwanda was the first country in East Africa to take steps to limit the use of plastic bags. As early as 2003, a study commissioned by the Rwandan Environmental Management Authority (REMA) highlighted the negative consequences of plastic waste on the environment (Behuria, 2018). Following this, the Rwandan government launched national awareness campaigns in 2004 (Behuria, 2019). In 2005, Rwanda banned the import and manufacture of plastic bags smaller than 100 microns. Then, in

2008, a law significantly reinforced this policy by banning all non-biodegradable polyethylene bags. (MINIJUST, 2008). This legislation made Rwanda one of the countries with the strictest plastic bag ban in the world. Rwanda thus played a pioneering and catalytic role within the East African Community, encouraging other countries in the region to also take similar measures (Behuria, 2019). In 2019, Rwanda reached a new milestone with the adoption of Law n° 17/2019, which extends the ban to most other single-use plastics (MINIJUST, 2019). This law bans the manufacture, import, use and sale of plastic carrier bags as well as many disposable plastic objects such as straws, cutlery, food containers, bottles, etc. It recognizes that many other types of plastic are equally harmful to the environment and aims to "control the growing habit of consuming and disposing of single-use plastic items that are becoming a burden on the environment" (Law no. 17/2019, art. 2). More broadly, Rwanda has put in place a policy and legislative framework conducive to good waste management, including plastics. The 2003 Constitution, revised in 2015, guarantees every citizen the right to a healthy environment and mandates the State to ensure its protection (Minolac, 2015). Law no. 04/2005 lays down the general principles of the country's environmental policy. In particular, it encourages the establishment of efficient waste collection services. Law no. 53/2007 also introduces a monthly community clean-up program for public spaces (known as umuganda in Kinyarwanda), aimed at developing a culture of maintaining a clean environment among the Rwandan population (Behuria, 2019).

### 3.2. Uganda

As early as 2007, Uganda announced its intention to ban plastic bags less than 30 microns thick, but implementation of this measure was postponed several times, until 2018 (Muheirwe *et al.*, 2023).. Despite these successive postponements, the Ugandan government has made several commitments since 2021. In particular, it has joined the UN's Clean Seas campaign to combat plastic pollution, and the Ministry of the Environment has reaffirmed its commitment to a complete ban on plastic bags (Rukikaire & Savelli-Soderberg, 2021). On the legislative front, the 1995 Constitution enshrines the right to a healthy environment, the 2019 National Environment Act bans certain plastic bags and products, and a 2020 regulation oversees waste management (ULRC, 1995; The National Assembly, 2004).

### 3.3. Kenya

Kenya has put in place a robust regulatory framework to combat plastic pollution, drawing on a variety of laws, regulations and initiatives. Flagship measures include:

1. The 2017 ban on single-use plastic bags for secondary packaging: This ban, published in the Official Gazette, prohibits the manufacture, import, distribution and use of single-use plastic bags for retail or household packaging. Fines ranging from US\$20,000 to US\$40,000 and/or prison sentences of one to four years are provided for in the event of non-compliance (NEMA, 2017).
2. The Plastic Bag Control and Management Regulation dated 2018: This regulation prohibits the manufacture, import, export, use or sale of plastic bags without a permit or payment of a fee. Approved manufacturers must develop and maintain a plastic bag collection, recycling and reuse plan, submitted annually to the National Environmental Management Authority (Luzze, 2023).



3. Ban on single-use plastics in protected areas (2020): This ban, also known as Gazette Notice 4858, aims to prohibit the use and discharge of single-use plastics in all protected areas, including national parks, beaches, forests and world heritage sites (MEF, 2020).
4. The Sustainable Waste Management Bill (2019): This bill assigns waste management responsibilities to national and regional governments, public and private entities, and citizens. It provides for the closure of open dumps, the expansion of the market for recycled products and the introduction of deposit-refund systems for packaging (Luzze, 2023).
5. Nairobi County Solid Waste Management Act (2015): This law provides a legal framework for solid waste management in Nairobi County, imposing environmental taxes and banning the manufacture of plastic bags smaller than 30 microns (Kairu, 2020).

### 3.4. The Democratic Republic of Congo (DRC)

In the Democratic Republic of Congo, although laws prohibit the production and use of certain plastic products, enforcement of these regulations remains weak on the ground (Mihigo, 2018). Decree n°17/018 of 2017 banned the production, import and use of plastic bags, pouches and packaging for food and beverages. However, these products continue to be imported and marketed with minimal restrictions (Vuligho, 2023). One of the reasons for this situation is a lack of effective controls and sanctions by the authorities. According to Waku Banza *et al.* (2024) plastic pollution, by clogging waterways and drainage systems, has already been linked to deaths during floods in the DRC. Despite these alarming facts, the implementation of existing environmental policies remains limited. At the legislative level, the DRC has several framework texts, such as the 2005 Constitution, Law n°1/009 of 2011 on the principles of environmental protection, and the 2002 National Environmental Action Plan (Vuligho, 2023). Nevertheless, these texts remain vague about the specific management of plastic waste.

### 3.5 Tanzania

The Tanzanian legal framework for plastic waste management is based on several key texts. It was the Environmental Management Act of 2004 that gave the Tanzanian authorities the legal means to combat polluting activities such as the use of single-use plastics (Sosovele, 2011). In 2019, the Tanzanian government took a decisive step by banning the production, import, sale and use of plastic bags with a thickness of less than 50 microns, with the exception of a few special cases such as industrial or medical packaging (Attorneys, 2019). This regulation also required producers and importers of plastic bottles to set up a collection and recycling system. More recently, in 2021, the ban was extended to plastic straws and lids for water bottles (The Guardian, 2021).

### 3.6 Burundi

The Burundian government has recognized the urgency of the situation and has adopted several legal instruments to govern the management of plastic waste. As early as 2000, the Environmental Code (Law no. 1/010) established the basic rules for protecting the environment against all forms of degradation, including plastic pollution (Republic of Burundi, 2000). This code was strengthened in 2021 by Law no. 1/09, which introduced amendments to better regulate waste management (MINEAGRIE, 2021). However, the most emblematic measure remains Decree No. 100/099 of August

8, 2018, which bans the import, manufacture, marketing and use of non-biodegradable plastic bags and packaging (MINEAGRIE, 2018). The decree, which came into force in January 2020 after an 18-month preparation period, provides for exemptions for certain specific uses such as medical or pharmaceutical packaging (AfricaNews, 2018; BBC Great Lakes, 2019). To facilitate implementation of this decree, a joint ministerial order (no. 750/540/710/1510) was adopted in October 2020, establishing penalties for offenders ranging from 2,000 to 100 million Burundi francs (MINEAGRIE, 2020). The government has also encouraged the development of sustainable alternatives, such as the local production of biodegradable packaging by companies like PACOBU, APBEE or BUJUMBURA-POLYTHENE (Irabaruta, 2020).

### 3.7 Southern Sudan

When South Sudan became an independent state in 2011 after decades of conflict (Kwori, 2019) the country lacked a comprehensive legislative framework on environmental issues. Over the years, the authorities began to address the environmental challenges facing the new nation. In 2015, following the example of its neighbors in the East African Community, South Sudan took the important step of banning single-use plastic bags (Kwori, 2019; Deutsche Welle, 2019). Although, according to these authors, implementing this ban remains a major challenge, it was a significant first step. At the same time, the country's Vision 2040 included among its objectives the improvement of environmental governance (Kwori, 2019) in which the government recognized the crucial issues linked to the poor management of plastic waste denounced by activists. According to Ugalla (2024) the authorities are currently working on a new environmental law that will be submitted to the appropriate legislative process. Among other things, this law aims to regulate the management of plastic waste, which threatens soils and aquatic ecosystems.

## 4. Strengths and gaps in the implementation of PDMPs in the EAC region

Analysis of the PDMPs implemented in the EAC region reveals both strengths and shortcomings in their effective implementation. One of the strengths identified is the political will shown by several governments to tackle this major environmental problem. Pioneering countries such as Rwanda have shown regional leadership by adopting strict bans on non-biodegradable plastic bags as early as 2008 (Behuria, 2019). Kenya has also put in place an ambitious regulatory framework to control and reduce the use of plastic bags (Luzze, 2023). This political determination has initiated a movement of awareness and behavioral change in these countries. Another strength lies in the public awareness-raising efforts undertaken by the authorities and civil society. A survey conducted by NEMA (2019) in Kenya revealed that the ban on plastic bags had led to an 80% reduction in plastic contamination in the ecosystem. In Burundi, the government has sought to promote the development of sustainable alternatives to plastic packaging (Irabaruta, 2020). These initiatives have facilitated social acceptance of the new regulations. However, despite these significant advances, there are still major shortcomings in the practical implementation of the PDMPs within the EAC. One of the main weaknesses identified concerns insufficient enforcement of the laws and regulations adopted. In Kenya, for example, despite the ban on plastic bags in 2017, smuggling from neighboring countries has persisted, threatening the effectiveness of the measures (NEMA, 2019). In Uganda and the DRC, the lack of controls and sanctions has greatly limited the impact of announced policies (Mugisha & Diiro, 2015; Vuligho, 2023). The lack of affordable and easily accessible alternatives to banned plastic products is another major shortcoming. In Tanzania and Burundi, for example, the high cost of reusable bags has hampered

their mass adoption by consumers and retailers (Enge, 2018; Irabaruta, 2020). This lack of viable alternatives has hampered the transition to more sustainable consumption patterns. In addition, the infrastructure for collecting and recycling plastic waste remains highly inadequate in most of the region's countries (Nakei et al., 2022). Even when bans are enforced, residual plastic waste is not properly managed, perpetuating environmental pollution. A cross-cutting gap lies in people's ingrained consumption habits, making it difficult to change behavior. In Kenya and Tanzania, despite awareness-raising efforts, plastic bags remain culturally associated with convenience, and their abandonment represents a major social and economic challenge (Kairu, 2020). **Table 1** summarizes these measures, strengths, weaknesses and impacts of the policies adopted by EAC countries.

**Table 1:** Main measures, strengths, weaknesses and impacts of policies adopted by EAC countries

<i>Country</i>	<i>Main measures</i>	<i>Forces</i>	<i>Weaknesses</i>	<i>Impacts highlighted</i>
Burundi	- Ban on non-biodegradable plastic bags in 2020 - Promoting local biodegradable alternatives	- Solid legal framework - Raising public awareness	- Uneven application - High cost of alternatives	- Plastics imports down - Residual plastic waste
Rwanda	- Plastic bag ban in 2008 - Extended ban on single-use plastics in 2019	- Strict application - Image as a green tourist destination	- Few affordable alternatives - Long transition times	- Near-disappearance of plastic bags - Impacts of new measures to be assessed
DRC	- Production and marketing banned in 2017 - Scattered regulations	- Initial legal framework	- Very limited application - Lack of national coordination	- Little visible impact - Persistent plastic pollution
Tanzania	- Ban on fine bags in 2019 - National Waste Management Strategy 2018	- Comprehensive regulations - Private sector involvement	- Insufficient controls - Lack of affordable alternatives	- Reducing plastic bags in the city - Significant residual pollution
South Sudan	- Plastic bag ban in 2015 - General environmental legal texts	- Political signal	- Virtually no application - Lack of dedicated resources	- Few concrete impacts - Persistence of previous practices
Kenya	- Plastic bag ban in 2017 - Extended producer responsibility regulations	- Robust legal framework - Emerging collection/recycling systems	- Persistent smuggling - Lack of affordable alternatives	- Estimated 80% success rate - Plastics still present in the environment
Uganda	- Partially enforced since 2007 - New regulations in 2019-2020	- Strong political commitment - Growing awareness	- Ineffective application - Competing economic interests	- Slight progress - Plastic pollution still a problem

## 5. Major challenges encountered in implementing the PGDPs

Beyond the specific gaps identified, the effective implementation of plastic waste management policies (PWMPs) in the EAC region faces several major challenges of varying nature. We have identified five



challenges: the cost of transition to sustainable alternatives, socio-cultural issues in the face of change, political considerations of various kinds, lack of adequate infrastructure for collection, and institutional and regulatory challenges. First of all, the economic challenge of transition costs to sustainable alternatives to single-use plastics should not be underestimated.

For the manufacturers concerned, abandoning the production of disposable plastics represents major investments to convert their factories and train their employees. In Kenya, manufacturers grouped together in the Manufacturers Association (KAM) have exerted constant pressure to defend their economic interests in the face of planned bans (Kairu, 2020). For consumers, the high price of reusable bags is also a notable brake on their adoption, particularly for low-income populations (Enge, 2018). A second challenge lies in the socio-cultural issues involved in changing acquired behaviours. In many countries, such as Tanzania, the widespread use of plastic bags is deeply rooted in everyday habits (Lawrence, 2019). Switching to reusable alternatives requires a change of mentality that is difficult to bring about, despite the awareness-raising campaigns run by the authorities. Political considerations also pose a major challenge. In countries such as Uganda, the economic weight of the plastics manufacturing sector has led the government to repeatedly delay and postpone the implementation of announced bans, for fear of the impacts on employment and investment (Behuria, 2019; Muheirwe *et al.*, 2023). Divergent interests between stakeholders within the executive itself have also hampered the implementation of ambitious policies (Behuria, 2021).

From an operational point of view, the crying lack of adequate infrastructure for the collection and management of plastic waste remains a major obstacle (IUCN Quantis, 2021; Nakei *et al.*, 2022). Even when plastic products are effectively banned, the absence of efficient collection and recycling systems makes their sustainable disposal very difficult, ultimately perpetuating environmental pollution. Last but not least, institutional and regulatory challenges are hampering the proper implementation of PDMPs. The lack of dedicated human and financial resources, the lack of coordination between different levels of governance (local, national, regional), legal loopholes and the inadequacy of planned controls and sanctions are all weaknesses noted in many countries (Welle, 2019). The current challenges in this region of East Africa are fundamentally linked to underlying structural elements. The dependence of EAC economies on raw natural resources and the import of finished products is one illustration, limiting their ability to allocate resources to sustainable options and develop domestic recycling sectors. In addition, disparities in socio-economic status and limited educational opportunities hinder behavioral change and the adoption of conscientious consumption behaviors.

## **6. Rwanda, a pioneering EAC country in the implementation of PGDPs**

Among the member countries of the East African Community, Rwanda is a pioneer and role model in the implementation of Plastic Waste Management Policies (PWMP). Since the early 2000s, Rwandan authorities have been aware of the need to act in the face of the growing environmental impacts of plastic pollution in the country (Behuria, 2018). It was in 2008 that Rwanda really made its mark by adopting one of the world's strictest laws on the subject. This law imposed a comprehensive ban on all non-biodegradable plastic bags, without exception or derogation. Rwanda thus became the African pioneer in the fight against single-use plastic bags. In 2019, the country took the next step by extending this ban to most other disposable plastics such as straws, cutlery, food containers or bottles (MINJUST, 2019). Beyond this pioneering regulatory framework, Rwanda's success lies in the strict and rigorous implementation of these policies. As soon as the ban on plastic bags was announced in

2004, the authorities undertook extensive information and awareness campaigns to prepare the ground for the population (Behuria, 2018; Ogutu et al., 2023). Once the law came into force in 2008, regular unannounced inspections were carried out to monitor businesses. Offenders were fined heavily and even risked prison sentences (Behuria, 2019; Kabera et al., 2019). Border controls were also stepped up to combat the smuggling of plastic bags from neighboring countries. This uncompromising enforcement of legislation quickly bore fruit. In just a few years, the use of plastic bags has been virtually eradicated in Rwanda. Streets, fields and waterways are now free of this previously ubiquitous visual and environmental pollution (Behuria, 2021). While this success was due to the political determination of the government, it was also facilitated by Rwanda's particular socio-economic context. Indeed, the country had only a fledgling plastics manufacturing industry with little influence at the time the banning measures were taken (Behuria, 2019). The few local producers of plastic bags had to cease operations, but were unable to really oppose the government's decision. The key factor in Rwanda's success thus lies in the virtuous alignment of several elements: early awareness of environmental issues, a strong political will to act, an ambitious regulatory framework, massive awareness-raising campaigns, strict enforcement accompanied by dissuasive controls and penalties, and finally a plastics industry that is still in its infancy (Behuria, 2018). This combination of factors has enabled a rapid and far-reaching transformation of single-use plastic production, distribution and consumption practices in Rwanda. The country has managed to eliminate this crisis in just a few years, at a pace that is the envy of many other nations.

## **7. Sustainability implications of PDMPs in the EAC region**

Beyond their direct impact in terms of reducing plastic pollution, the plastic waste management policies (PGDP) implemented have profound and lasting implications on several levels. On the environmental front, when effectively applied as in Rwanda, PDMPs help preserve terrestrial and aquatic ecosystems by considerably reducing the presence of plastic waste (Behuria, 2021). However, in several countries such as the DRC and Uganda, plastic pollution persists due to limited enforcement of regulations (Mugisha & Diiro, 2015; Vuligho, 2023). In terms of health, removing plastic waste from the environment has reduced health risks linked to exposure to plastic particles and associated chemicals, such as respiratory and digestive pathologies (Behuria, 2018). Nevertheless, these benefits remain uneven across countries, with rural areas still suffering from this pollution in several states.

On the economic front, in pioneering countries like Rwanda, PDMPs have boosted key sectors such as green tourism, which has become the leading foreign exchange earner (Danielsson et al., 2017; Kabera et al., 2019). They have also stimulated the circular economy, with the emergence of companies offering sustainable alternatives to plastics. But in other countries, such as Uganda, diverging economic interests have held back the adoption of these policies (Behuria, 2021). Some studies have already attempted to quantify these economic impacts. For example, a cost-benefit analysis carried out in Kenya estimated that banning plastic bags would result in an additional cost of around \$38 million per year for households, but would generate savings of between \$19 and \$38 million in terms of avoided environmental costs (Bhattacharya et al., 2018). On the social front, the success of the PGDPs has strengthened national pride and cohesion in Rwanda, with concrete improvements in the living environment (Behuria, 2019). However, the lack of citizen awareness in several other countries has limited the social appropriation of these policies (Mihigo, 2018). In geopolitical terms, being a forerunner in the fight against plastic waste has enabled Rwanda to gain leadership and legitimacy on

the regional and international stage (Behuria, 2019). But this green "soft power" remains limited for other countries, whose actions lack ambition and concrete results. In short, while the ambitious and rigorously applied PGDPs have set in motion a virtuous dynamic in environmental, health, economic, social and geopolitical terms, many challenges remain to ensure their full effectiveness and widespread application in all EAC countries.

## **8. Perspectives for the implementation of PGDPs adapted to the socio-economic context of the EAC region**

The regional and national initiatives underway within the East African Community provide a promising basis for tackling the major challenge of plastic waste management. However, further concerted efforts will be required to maximize their impact. At regional level, the rapid adoption and ratification of the EAC bill on the control of polyethylene materials by all member states would appear to be a priority (UNEP, 2023). A harmonized and binding legal framework would make it possible to effectively combat cross-border trafficking in plastic bags, which currently undermines the impact of national bans, as observed in Kenya and Rwanda (Nkurunziza, 2022; Omondi & Asari, 2021). This regional legislation will need to be accompanied by real capacity-building in terms of customs controls, monitoring and penalties for offenders. A dedicated regional fund could be created to support the countries with the greatest difficulties in implementation, drawing inspiration from similar initiatives aimed at strengthening cooperation on cross-border environmental issues (Knoblauch et al., 2018a). In addition, a major large-scale awareness-raising effort, aimed at the general public as well as private economic players, seems essential to bring about changes in consumer attitudes and practices (Oyake-Ombis et al., 2015). Joint campaigns under the aegis of the EAC, involving NGOs, media and influencers, would amplify this impact. In addition, the question of funding and external support is crucial to developing the necessary infrastructure, promoting sustainable alternatives and ensuring rigorous monitoring. The mobilization of adequate funding, whether at national level or through regional or international mechanisms, will be essential to meet these challenges (Gall et al., 2020; Knoblauch et al., 2018b). The involvement and structuring of the vast informal sector of plastic waste collectors, which already plays a key role in recycling (Gall et al., 2020) is a high-potential lever. By improving their working conditions and access to recycling channels, this essential link in the circular economy could become a powerful driver of future transitions. Finally, interdisciplinary cooperation is essential for the formulation of sustainable solutions. Those skilled in materials science have the capacity to make a valuable contribution to the creation of environmentally-friendly substitutes for conventional plastics, through the development of other easily recyclable products. Economists can play a crucial role in developing effective incentive mechanisms to encourage the adoption of a circular economy. The knowledge provided by anthropologists and sociologists is essential to understanding the complex cultural and social determinants that influence pollution patterns and attitudes to waste management.

## **Conclusions**

This critical analysis of plastic waste management policies in EAC countries provides a rich and nuanced set of lessons. While the measures adopted by some countries, such as Rwanda and Kenya, have had tangible impacts, others, such as the DRC and South Sudan, are lagging far behind. Overall, although significant progress has been made, major challenges remain in effectively eradicating plastic

pollution in the region. This study highlights the need to step up coordinated efforts at regional level, to ensure rigorous application of regulations through effective monitoring and control, and to involve all economic and civil society players. The time has come to act decisively and pragmatically, mobilising all the regulatory, economic and technical levers available. There is no doubt that the EAC countries have the human and natural resources and the potential for innovation needed to meet this challenge head-on and become inspiring role models in the fight against plastic waste. By combining political will, ambitious legal frameworks, credible alternative solutions and a change in attitudes, a future without plastic pollution is within reach for the people of East Africa. It is essential to stress that this study is subject to certain constraints. The availability of reliable quantitative data on the effects of GDP in the ACE region is still limited. In addition, the review focused mainly on national and regional regulations, without taking into account local projects and unofficial methods of dealing with plastic waste. Further investigation is needed to examine these aspects and achieve a more complete understanding of the scenarios.

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