



#### Acknowledgements

This Country Profile on plastic policies in Nepal was prepared on behalf of the EU SWITCH-Asia Policy Support Component (PSC) by Ms Maro Luisa Schulte and Dr Per-Olof Busch under the supervision of Ms Cosima Stahr and Dr Zinaida Fadeeva, Team Leader, SWITCH-Asia Policy Support Component.



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# **Abbreviations**

**GRWM** Green Road Waste Management Pvt. Ltd.

MoFE Ministry of Forests and Environment

**LVP** low-value plastic

**PET** Polyethylene terephthalate

### 1. Context

In Nepal, annual plastic waste amounts to slightly more than 242,000 tonnes, or 7.9 kg/capita/year (EA 2024) (Figure 1). This is about one-quarter of the global average (31.9 kg), and roughly half of the average, in countries where the SWITCH-Asia programme is active (20.1 kg).

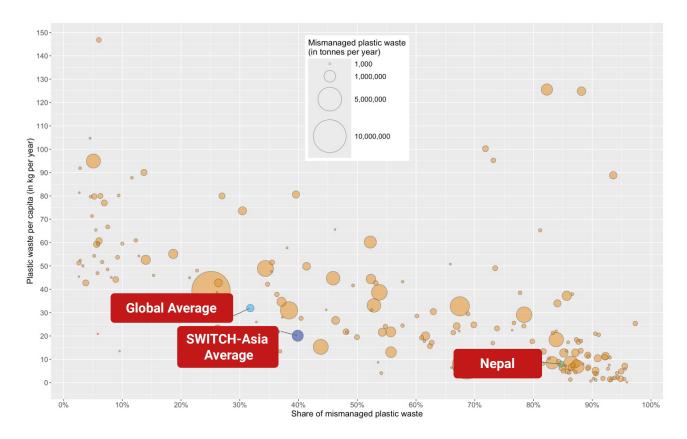


Figure 1. Plastic waste in Nepal in 2023

Source: Earth Action 2024 data, authors' calculations

The amount of mismanaged plastic waste is high: more than 205,000 tonnes, or 85% of all plastic waste. This equals 6.7 kg mismanaged plastic waste per capita per year, which is slightly more than half of the average of countries that are covered by the SWITCH-Asia programme (12.2 kg per capita per year) and the global average (12.5 kg per capita per year).

Rank of Nepal in global comparison (out of 192, 192 being the highest in pollution/mismanagement)				
Plastic waste in metric tonnes	118			
Plastic waste per capita (kg/year)	39			
Mismanaged plastic waste in metric tonnes	143			
Mismanaged plastic waste per capita (kg/year)	78			
Share of mismanaged plastic waste	135			

A survey of waste management by the Central Bureau of Statistics in Nepal in 2020 (Government of Nepal 2020) revealed the main causes for this high share of mismanagement. In this survey, 49% of all municipalities reported that they pile up waste, including plastic waste, in landfill sites; more than 31% reported that they burn it in open dump sites; and more than 27% reported that they pile up the waste on the

banks of rivers. Of the 97 landfill sites that the municipalities were using, only 7 had treatment processes and equipment in place to prevent leakage of waste into the surrounding environment. Only 14% of all municipalities reported that they recycled the waste – and the share of recycled waste amounted to only slightly more than 4%.

There is neither an oil and gas industry in Nepal, nor the production of primary plastics. According to data from the World Bank, the chemical sector contributes only 0.4% to Nepal's gross domestic product (GDP) and, according to data from the United Nations Commodity Trade Statistics Database (UN Comtrade), Nepal is a net importer of chemicals, with a negative trade balance of USD 125.5 million in 2021.

Nepal is a net importer of plastic-related products. The overall total volume of plastic-related trade amounts to slightly more than USD 1 billion, of which more than USD 131 million are exports and more than USD 946 million are imports (Figure 2), resulting in a negative trade balance of almost USD 805 million. Overall, Nepal's plastic-related trade accounts for less than 0.04 per cent of the global plastic-related trade.

Nonetheless the plastic-related trade also suggests that there is some domestic production and manufacturing of plastic goods in Nepal. The data show that Nepal imports not only intermediate or final manufactured plastic goods, but also the materials used to produce and manufacture these goods. In Nepal in 2021, these imports were worth almost USD 583 million, a share of 62% of all plastic-related imports. Regarding intermediate manufactured plastic goods, Nepal also exported goods worth more than USD 115 million (with a negative trade balance for such goods nevertheless). According to Complast Nepal (2024), Nepal has more than 500 plastic manufacturing units, predominantly located in and around Kathmandu. The majority of these are small and medium enterprises (SMEs). According to the same source, the Nepali plastic industry is worth around USD 500 million and is rapidly growing. Plastic packaging and other plastic products are manufactured as consumer goods, and for use in households, construction, agriculture, industry and textiles.

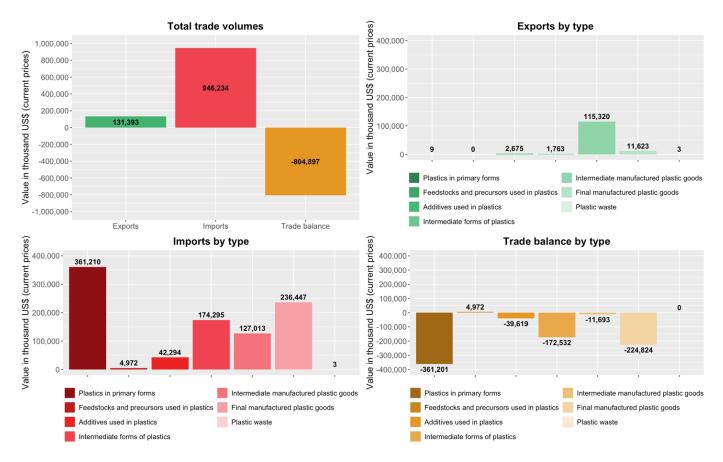


Figure 2. Plastic-related trade in Nepal in 2022

Source: UNCTAD data

# 2. Policy landscape

The Nepalese policy approaches to address plastic pollution are quite narrow, and focus on the manufacturing and waste stages of the plastics life cycle, as well as on trade. National approaches are solely command-and-control measures, while information or market-based policy measures are not being used. See Table 1, below, for an overview of policies related to plastic waste in Nepal.

So far, the most important target of Nepalese policies to reduce plastic pollution have been several initiatives related to plastic bags, dating to April 2015 – just weeks before the devastating earthquake which largely side-lined this initiative. More recently, the Nepalese government adopted the **Action Plan for Ban on Plastic Bags** in May 2022 (Shrestha 2023). This plan features four important measures:

- 1. Prevention of the importation of thin plastic products (i.e. thinner than 40 microns)
- 2. Ban on single-use plastic bags (thinner than 40 microns)
- 3. Financial support to encourage (more) eco-friendly bags
- 4. Consumer campaign for the use of eco-friendly bags

However, from conversations with policymakers it can be presumed that the ban is not being enforced.

As a second upstream policy, Nepal adopted a prohibition on the production, sale, import, distribution, and storage of plastic artificial flowers in May 2021, including garlands and bouquets (HKTDC Research 2022). Other similar measures include a ban on single-use plastic products in the Everest region (in place since 2020) and a ban on plastic bottles in four- and five-stars hotels (announced in October 2024) (Prasain 2024).

Regarding downstream measures, the **National Environmental Policy (NPE)**, which was published in 2019, also addresses plastic waste, even if only very generally (Government of Nepal 2019). This Policy highlights the detrimental impact of plastic on ecosystems and human health, promoting a comprehensive approach to reduce environmental pollution and promote sustainable practices. The importance of reducing plastic use is encouraged via the adoption of alternatives to single-use plastics. Increased public awareness and education on the negative effects of plastic waste are endorsed so as to foster behavioural changes in consumption patterns. The NPE further outlines strategies for enhancing waste management systems, including segregating and recycling plastic waste while calling for the development of infrastructure to support recycling initiatives and the promotion of circular economy principles. The policy also suggests implementing stricter regulations and enforcement mechanisms to control plastic production and disposal. Finally, collaboration between government bodies, private sectors, and communities to effectively manage plastic waste is encouraged with an aim to integrate plastic waste management into broader environmental and economic planning, ensuring that efforts are aligned with national sustainability goals. By addressing all of these aspects, the NPE policy seeks to mitigate the environmental impact of plastic and contribute to a cleaner, healthier environment.

Likewise, the latest five-year plan (**The Sixteenth Plan, Fiscal Year 2025/26–2029/30**), published in June 2024, addresses plastic pollution as part of broader environmental and sustainability initiatives (Government of Nepal 2024).

Environmental Impact and Waste Management: The Plan highlights the importance of managing waste
sustainably to minimise environmental harm, emphasising the need for reducing, reusing, and recycling
waste with the participation of the private sector to make waste management more sustainable and
eco-friendly. Specifically, there is mention of imposing restrictions on burning and disposing of waste
in rivers and forests, and implementing taxes on waste dumped in landfills.

- Plastic Control Measures: Measures to control plastic waste, emphasising the regulation of plastic
  products, are outlined in the Plan as well. Implementing scientific and transparent standards for
  the extraction and use of natural resources, including the regulation of plastic products to reduce
  environmental impact, is suggested.
- **Broader Environmental Strategy:** All of these measures are part of a broader strategy to enhance environmental monitoring and regulation, aiming to improve air quality and reduce pollution. The strategy includes expanding pollution measurement centres and ensuring compliance with environmental impact assessments.

Overall, The Sixteenth Plan highlights the importance of integrating environmental conservation and climate resilience into development management, with specific actions targeting the reduction of plastic waste and its environmental footprint.

The previous five-year plan **The Fifteenth Plan, Fiscal Year 2019/20–2023/24**, published in March 2020, had already addressed plastic pollution as well. The strategies and working policies of this Plan prescribed restrictions on the production and use of plastics not in compliance with certain standard, and the adoption of reuse policies (which – to our best knowledge – have not yet been adopted) were announced (Government of Nepal 2019).

With regard to the management of plastic waste, three other policies are also relevant, and they define the basic policy framework for the management of solid waste, which by definition includes plastic waste although none of the texts mentions plastic waste specifically.

- 1. Most recently, the **Environmental Protection Regulations** from 2020 outlines the most important aspects of waste management in several sections, focusing on the regulation and management of waste to minimise environmental impact. Key points are summarised below.
  - Waste management practices: The regulations outline the practical requirements for managing waste, including the segregation, recycling, and proper disposal of waste materials. They emphasises the use of alternative substances, technology, tools, and equipment to aid in pollution control and waste management.
  - Hazardous waste: Special attention is given to the management of hazardous waste, including
    collection, storage, processing, and disposal. The regulations specify the need for permits for handling
    hazardous waste, and they outline the responsibilities of the individuals and organisations involved in
    waste management.
  - Public waste management: Local authorities are tasked with the segregation and management of
    waste according to the nature of the waste to ensure that waste is recycled and reused where possible.
    The regulations also mention the responsibility of local governments to remove waste that poses a
    threat to public health and the environment, with costs to be recovered from those responsible for
    improper disposal.
  - Waste management in protected areas: Specific guidelines are provided for managing waste in environmentally sensitive areas, such as national parks and conservation areas, to prevent pollution and protect biodiversity.

These regulations are designed to ensure that waste management practices in Nepal are sustainable and environmentally friendly, reducing the potential for pollution and environmental degradation. They build on and complement previous policies with similar approaches.

2. The **Solid Waste Management National Policy** from 2022 provides a comprehensive framework for both national and local governments to manage waste effectively, including plastic waste. The primary goals are to simplify waste management, reduce environmental pollution and public health risks, utilise waste as a resource, encourage privatisation, and boost public support through increased awareness. This policy considers local government as crucial in waste management and seeks to make local entities more competent in managing waste challenges while fostering public-private partnerships. It aims to empower

local entities by enhancing their capacity to deliver skilled human resources and effective sanitation services. In addition, it requires that there be a dedicated sanitation unit in municipal and town areas where waste is problematic. Local bodies must coordinate with national institutions to handle waste collection, site management, transportation, and disposal, potentially collaborating with the private sector (Government of Nepal 2020; VIN 2024).

The Solid Waste Management National Policy is spelled out by two additional laws. The **Solid Waste Management Act** from 2011 and the related **Solid Waste Management Rules** from 2013 serve as the primary legal framework for managing solid waste in Nepal, detailing responsibilities from central to local levels. These official documents prescribe that local bodies must manage solid waste by constructing and operating facilities like transfer stations, landfills, and processing plants. Local bodies are also mandated to separate waste at source and are tasked with waste collection, disposal, and processing. Additionally, local bodies must organise waste at collection centres, transfer stations, or processing sites, and explore alternative uses for the waste (Government of Nepal 2020; VIN 2024). The **Local Government Operation Act** from 2018 further specifies the roles and responsibilities of local bodies, emphasising health and sanitation and encouraging municipal partnerships. Key responsibilities include promoting sanitation awareness, managing waste collection, recycling, disposal, and tariff regulation, and fostering partnerships with private and non-governmental entities (Government of Nepal 2020).

With no production of plastic polymers or plastic feedstock within the country, Nepal is not in need of domestic regulations targeting the first stage of the plastics life cycle. The country would, however, potentially benefit from global upstream measures limiting the overall manufacturing of plastic products, as currently discussed under the negotiations for a Global Plastics Treaty.

### Table 1. Overview of plastic-related policies in Nepal.

Source: adelphi. (blank cells in some cases indicate absence of policies, however it could be that information was not found at the time of online research)

	Production (primary polymers)	Manufacturing (plastic products)	Consumption	Waste management/ End-of-life	Trade	
COMMAND AND CONTROL						
Mandatory performance/outcome standards (incl. targets)						
Mandatory process standards (incl. targets)						
Technological standards (incl. targets)						
Prohibitions/bans (incl. phaseout)		<ul> <li>Plastic bags ban (2011, 2015)</li> <li>Ban on plastic flowers (2022)</li> <li>Ban on plastic bottles in four- and five-stars hotels (2024)</li> </ul>		<ul> <li>Solid Waste Management Act 2011</li> <li>Solid Waste Management Rules 2013</li> <li>Local Government Operation Act 2015 (LGO Act)</li> </ul>	• Ban on plastic flowers (2022)	
MARKET-BASED						
Taxes/levies						
Subsidies/grants/tax reductions						
Public procurement						
EPR/deposit refund schemes						
Liability schemes						

	Production (primary polymers)	Manufacturing (plastic products)	Consumption	Waste management/ End-of-life	Trade		
INFORMATION							
Taxonomies							
Data collection, reporting and disclosure							
Labels							
Awareness raising/ capacity development	Awareness raising and capacity development initiatives are predominantly implemented by non-state actors in Nepal. One example is the Parya Sampada project, which involves community engagement and behaviour change campaigns, particularly in areas like Bungamati, where 35% of non-biodegradable waste is plastic. The project has successfully distributed jute bags and disseminated messages to discourage the use of plastic bags (UN Nepal 2023)						
		GOVERNANC	E/COORDINATION				
Roadmaps, plans and strategies	<ul> <li>National Environmental Policy 2019</li> <li>The Sixteenth Plan Fiscal Year 2025/26 – 2029/30</li> </ul>	<ul> <li>Action Plan on Plastic Bags 2022</li> <li>The Sixteenth Plan Fiscal Year 2025/26 – 2029/30</li> </ul>		<ul> <li>National Environmental Policy 2019</li> <li>The Sixteenth Plan Fiscal Year 2025/26 - 2029/30</li> <li>Environmental Protection Regulations from 2020</li> <li>Solid Waste Management Act 2011</li> </ul>			
Inter-ministerial coordination	A recent workshop organised by the United Nations Office for Project Services (UNOPS) has revealed that both nationally and regionally, coordination and cooperation among ministries and other departments need to be improved (CREASON 2024). Two committees were however announced, one responsible for coordination at the national and the other at the provincial level (CGED Nepal 2023)						
Public-Private partnerships	UNDP Accelerator Lab Nepal						
SPECIAL FOCUS SECTOR: AGRICULTURE							
	One large consumer of plastic in Nepal is the agriculture sector. This sector uses a significant amount of plastic materials, including plastic films for greenhouses, irrigation pipes, and packaging for agricultural products. The widespread use of plastic in agriculture contributes substantially to plastic waste.						
	There is no regulation of the use of plastics in the agricultural sector in Nepal.						

## 3. Good practices in the private sector

Many initiatives from the private sector address diverse aspects of plastic pollution in Nepal and provide different approaches to reduce plastic pollution.

First, there are initiatives for transforming plastic waste into other products. The most promising in this regard is perhaps the P2G (Plastic to Ghar) programme, particularly given the specific challenges in countries with large areas of remote high-mountains like Nepal (Park 2024). This innovation and business support ecosystem aims to tackle plastic pollution through a circular economy approach, focusing on upcycling plastic waste into valuable products. Supported by the University of Cambridge, Impact Hub Kathmandu, and FabLab Nepal, the initiative targets remote Himalayan regions where waste management is made more challenging by isolation and logistical difficulties. P2G seeks to address these issues by establishing decentralised, small-scale plastic remanufacturing units, empowering local communities to innovate and create housing materials from plastic waste, and fostering local economic development and environmental sustainability. The initiative seeks to leverage local resources and engage community stakeholders to create a self-sustaining industry. By providing financial and administrative support, P2G facilitates the acquisition of upcycling machinery, and moreover offers extensive training, thus fostering local entrepreneurship. P2G is particularly focused on producing housing materials, such as roofing tiles and insulation, to address the urgent need for resilient housing following the 2015 earthquake as well as to combat deforestation by reducing reliance on firewood. The programme has successfully incubated several start-ups, creating employment opportunities and fostering a new market for upcycled materials. Another example is Green Road Waste Management Pvt. Ltd. (GRWM), which spearheaded the creation of plastic bricks and roadpaving materials out of non-recyclable plastics, such as sachets (UNDP 2024).

Second, a number of companies are engaging in collection and recycling. An overview of four such initiatives follows.

- Taking a market-based approach, the Nepali branch¹ of the German civil society organisation NIDISI aims to integrate low-value plastic (LVP) back into the value chain by developing scalable solutions and investing in local recycling centres. Through a social business model based on Plastic Credits, the revenue generated is used to subsidise recycling processes while supporting initiatives like utilising LVP in road construction. Collaborating with academic partners like the Fraunhofer Company,² they have innovated processes for enhancing road quality with LVP while lowering costs (NIDISI n.d.).
- The Partnership for Sustainable Development Nepal (PSD Nepal)<sup>3</sup> has undertaken the task of collecting Polyethylene terephthalate (PET) bottles in Langtang National Park in a team effort with Himalayan Life Plastic.<sup>4</sup> These bottles are recycled and transformed in Nepal's only recycling plant in Pokhara, where they become PET pellets suitable for food contact. Annually, the plant is recycling roughly 1,200 tonnes of plastics, thereby offsetting approximately 4,000 tonnes of CO<sub>2</sub> (Himalayan Life n.d.).
- A collaboration facilitated by the UNDP Accelerator Lab Nepal<sup>5</sup> has been exploring various avenues for
  plastic waste management by working with local governments and private sectors to explore recycling
  PET bottles through Reverse Vending Machines and converting plastic waste into processed plastic
  pellets and granules for new products (Bajracharyia 2020).

I NIDISI Nepal, Humanity Can Do Better, https://nidisi.com/nepal/. About NIDISI: https://nidisi.com/about

<sup>2</sup> The Fraunhofer-Gesellschaft, based in Germany, is an applied research organisation, https://www.fraunhofer.de/en.html

<sup>3</sup> PSD works with the poorest communities in Nepal, https://www.psdnepal.org/

<sup>4</sup> Himalayan Life, non-profit organisation working with children in India and Nepal, https://himalayanlife.com/projects/himalayan-life-plastics/

<sup>5</sup> UNDP [Accelerator Labs] Nepal, https://www.undp.org/nepal/blog/plastic-waste-management-why-collaborative-efforts-are-necessary

Recycler Saahti, a collaboration between CREASION and Coca-Cola launched in 2019 aims to establish
a self-sustaining PET bottle recycling system in Nepal. The project seeks to formalise Nepal's waste
management sector and develop a reliable recycling mechanism. It focuses on collecting and recycling
PET bottles, enhancing waste workers' skills and livelihoods, and promoting a shift in attitudes towards
recycling among households and institutions. Since 2019 this initiative has collected and recycled
more than 7,000 tonnes of PET bottles (CREASION 2024).6

Third, initiatives are focusing on alternative plastic products or substitutes for plastic products. **Zero Circular**, for example, has developed a plastic bag that biodegrades within 180 days in a home compost bin or garden (Piya and Luitel n.d.). The start-up **Eco Sathi** produces everyday products such as combs, brushes, toothbrushes and water bottles, among others, out of non-plastic materials such as bamboo, wood or glass (Budhathoki 2021). Somewhat related, the **Hotel Association Nepal** voluntarily committed to banning single-use plastics in all hotels in Nepal starting on January 1, 2025. So far, most big and luxury hotels have complied with this initiative, while smaller hotels are struggling with the costs of alternatives to single-use plastics (Prasain 2024).

<sup>6</sup> CREASION, 2024, Recycler Saathi. Nepal's own self-sustainable recycling, enterprisehttps://creasion.org/projects/recycler-saathi

# 4. Challenges

The largest central challenge to preventing plastic pollution in Nepal is the lack of a functioning, modern, and environmentally sound waste management infrastructure and system that would keep plastic waste out of the environment where is continues to pollute (Government of Nepal 2020; Park et al. 2024). The amount of (plastic) waste in the country often overwhelms existing waste management capacities. The lack of sufficient capacity for waste disposal in landfills, let alone other forms of waste treatment, is striking in both urban and rural areas. There are far too few waste segregation facilities, sorting plants or recycling centres. This often leads to open burning of plastic waste or dumping it into rivers. In addition, rural areas often lack adequate waste collection. Waste segregation at source occurs in only 25% of all Nepalese municipalities (VIN 2024).

However, the development of an environmentally sound waste management system would require significant investments, in Nepal and elsewhere. And Nepal is a developing country with limited financial resources to invest. In addition, the costs of building and maintaining infrastructure in difficult terrain are particularly high. Prioritising these expenditures can be challenging given other pressing development needs (Government of Nepal 2020). Since the devastating earthquake in 2015, the country's priorities have been aimed at alleviating poverty, establishing or rebuilding infrastructure, and extensively re-structuring governmental responsibilities across national and federal levels (World Bank 2024; Park et al. 2024). Moreover, some complain that policymakers have so far shown only limited interest in plastic pollution and the management of plastic waste (Park et al. 2024).

The geographic characteristics of Nepal, from lowland tropical areas to remote, high-altitude mountains, pose significant challenges to the development of sound waste management systems (Park et al. 2024). Collecting and transporting waste across such diverse landscapes requires substantial infrastructure, which is lacking, particularly in remote and mountainous regions. Particularly in urban areas, three-quarters of the municipalities in Nepal dispose of waste predominantly in open spaces rather than in controlled landfill sites (UNDP 2020). Meanwhile, the sparsely populated and remote mountainous areas may not justify the high costs of extensive (plastic) waste management infrastructure, leading to improper disposal practices. What makes regular (plastic) waste collection services even more challenging to implement is that many areas are difficult to access due to the lack of roads in rugged terrain (Basel Convention secretariat et al. 2022).

Thus, waste management is largely left to informal waste workers who struggle in the few existing landfills or collect recyclables on people's doorsteps (Labra Cataldo et al. 2023). Estimates suggest that in Kathmandu informal waste workers collected 10 tonnes of plastic waste each day in 2021 (VIN 2024). While these workers collect mostly the higher-value plastics such as PET, much of the lower-value plastic waste is openly burned or dumped at riversides (with associated negative effects on human health and the environment). Nepal, like many other countries with a strong informal waste sector, will need to consider how these workers can be inserted into safer, more formal structures, without simply taking away their source of income (see also Bajracharya et al. 2024).

The lack of capacity is also an issue regarding the enforcement of policies targeting the life cycle of plastics, such as the bans on certain plastic products described above (Aryal 2024). Furthermore, policies and regulations on waste segregation often suffer from weak enforcement (VIN 2024).

To summarise, there is currently in Nepal neither a functioning system to monitor plastic products and waste nor any reliable figures on which products most often end up in the environment (Aryal 2024).

## 5. Way forward

Establishing a functioning, modern, and sustainable waste management infrastructure and system in Nepal is a priority solution for preventing plastic pollution in the environment. In this regard, Nepal could profit from the Global Plastics Treaty. Treaty provisions on financing the treaty's implementation would be of great importance for a developing country like Nepal. These would enable financial flows from public and private sources into improving waste management systems in developing countries that currently lack financing and capacity. As Nepal needs to consider the integration and support of informal waste workers into more efficient waste management processes, training, equipment, and/or health and safety improvements for informal workers would also be important to increase collection, segregation and recycling rates of plastic (and other) waste (Labra Cataldo 2023; VIN 2024). To create demand for recycled material, there would need to be provisions at international or national level to incentivise this.

In addition, enforcement needs to be strengthened, for example through more thorough monitoring of compliance with already existing policies and regulations, and through stringent penalties for non-compliance (VIN 2024).

Nepalese waste management would benefit from an analysis of waste flows, in order to identify those products that are predominantly found in the environment. These could then be targeted in a more strategic way.

Overall, there are calls for using market-based mechanisms in order to a) disincentivise the use of plastic products, and b) increase domestic funds that could in turn be used to improve the country's waste management system. For example, the government could use taxes or fees on plastic products from non-recycled materials or on certain problematic and avoidable single-use plastics as disincentives, which would at the same time create more revenues that then could be used to the improve the national waste management infrastructure and system. The effects of favourable tax rates for more environmentally friendly products can be observed in terms of rising numbers of imported electric vehicles, which coincided with lower import taxes compared to fossil-fuelled vehicles (World Bank 2024). The government could also incentivise recycling through tax exemptions for recycling businesses, as called for by Himalayan Life Plastics (Khadka 2024).

Finally, extended producer responsibility (EPR) offers a practical route to curb Nepal's pervasive plastic pollution by obliging producers — including large multinationals — to fund collection, recycling and design improvements. Properly implemented EPR would mobilise private finance for collection infrastructure, formalise informal waste workers, and create markets for recycled polymers while incentivising eco-design and reduced packaging (The Himalayan Times, 2024; RiPL/Grid-Arendal, 2025). Piloting producer responsibility organisations and binding targets for major brands, supported by technical assistance and leakage-reduction measures, can rapidly cut riverine and urban plastic losses.

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