



CLOSING  
THE LOOP

# CLOSING THE LOOP ON PLASTIC POLLUTION IN DA NANG CITY, VIET NAM

Summary of Baseline Report

August 2021



# Statement of

## Director of Department of Natural Resources and Environment (DONRE), Da Nang City



With a population of about 1.1 million people, Da Nang City is a dynamic coastal city, which is rapidly developing in the central region of Viet Nam. Along with economic growth, the amount of solid waste generated is constantly increasing. On average, the City generates about 1,100 tons per day, of which plastic waste accounts for a large proportion and is expected to increase in coming years. If not strictly controlled, plastic wastes will affect the quality of the environment, marine ecosystems and human health.

On 4 December 2019, the Government of Viet Nam issued the National Action Plan for Management of Marine Plastic Litter by 2030 (Decision No. 1746/QD-TTg). The National Action Plan aims to prevent and reduce ocean plastic waste from waste sources on land and activities at sea, to completely eliminate the use of single-use plastic products and plastic bags from resorts, tourist attractions, accommodations and other tourist service businesses along the coast to ensure no plastic wastes in marine protected areas.

Building on the Da Nang - An Environmental City Plan, in addition to a series of other development goals, the city's Department of Natural Resources and Environment (DONRE) with the People's Committee Danang City issued the following Action Plan to Manage Marine Plastic Litter in Da Nang City by 2025, With A Vision Towards 2030 (KH 122/KH-UBND) on June 24, 2021.



With technical support of many national and international organizations the Project 'Closing the Loop: Innovation and Scaling Up to Solve the Problem of Plastic Pollution in Marine Areas in ASEAN Cities' by the United Nations Social Commission of Asia and the Pacific (ESCAP), supported by the Government of Japan. Together, with the Institute for Global Environmental Strategy (IGES), University of Leeds and International Union for Conservation of Nature (IUCN) Da Nang City has created baseline research to identify plastic waste and potential sources of plastic leakage to the environment, establishing highly feasible target actions.

Promoting these very important results, the Department of Natural Resources and Environment of Da Nang City will continue to make efforts and coordinate with national and international organizations to effectively mobilize the participation of all organizations and communities. The people of the city aim to minimize the amount of plastic waste, contributing to the construction of an Environmental City!

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# Acknowledgements

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# Key Findings and Recommendations

## Key Findings

- Plastic pollution is a major problem in Da Nang City and requires immediate strategies and policy actions to mitigate the impact on the environment and economy. The majority of plastic waste generated is composed of single-use plastic bags (48%), plastic films (18%) and plastic bottles (7.5%) sourced from residential areas.
- Approximately 8% of the plastic waste from land-based sources enters the environment, primarily through fly-tipping, littering and uncollected waste. 1.3% of this becomes marine litter, which may seem small, but is equivalent to 1,087 tonnes per year and many millions of plastic products.
- Lightweight plastic waste (i.e. bags and films) is a particular problem as it is low value, making it unappealing for recyclers and highly mobile in wind or waterways.
- Although Viet Nam's *The National Action Plan for Management of Marine Litter by 2030* aims to reduce fishing gear littered in the ocean, Da Nang City does not yet have a clear strategy to combat this pollution.
- Da Nang City has established ambitious targets in their policies regarding waste separation at its source and 3R activities. However, progress has been limited to pilot areas, partly due to a lack of public awareness, cooperation and monitoring capacity.
- The City needs to lead structural interventions to reduce single-use plastic products. These will include measures like advanced monitoring systems and better sorting mechanisms at the source of waste, including residential communities, public institutions, schools, retailers and agriculture and aquaculture businesses.

## Plastic Waste Management Priorities



### Reduce use of single-use plastics, including plastic bags and plastic bottles

#### Why?

These products are the most common marine plastic litter in Da Nang City; *The National Action Plan for Management of Marine Litter by 2030* mandates that 100% of single-use plastic in tourism areas be reduced, and 75% of the total marine plastic litter will be reduced by 2030.

#### How?

Enhancement of waste separation activity at source; research and technology development on alternative material such as biodegradable plastic through building networks and developing skills; development of regulations such as bans, tax/levy for commercial sectors to limit the use of single-use plastics.



### Reduce littering and open dumping, and increase collection

#### Why?

Littering, open dumping and inadequate waste collection are the leading causes of plastic pollution, particularly in the tourist areas; 100% waste collection by 2030 is mandated by the Da Nang City Waste Management Plan.

#### How?

Strengthen controls on littering and ensure waste bins in tourism areas; enforce legislation for waste collection and treatment at source, including residential, institutional, commercial, and industrial areas.



## Increase source separation and collection

### Why?

In Da Nang City, only 6.1% of plastic is currently recycled, compared to the national average of 10-15%; the goal of Vision 2050, the City is to have 100% of waste separated at source by 2030, and 95% of waste to be reused, recycled or composted by 2050.

### How?

Strengthen the implementation of sorting, collection, research and apply recycling technology and techniques through business investment and support from international cooperation.

## Plastic Waste Policy Priorities



## Implementation of policy

### Why?

Alignment with national policy. The National Action Plan requires 100% of abandoned fishing gear to be collected, 100% of single-use plastic at tourism areas to be reduced, and 75% of marine plastic litter to be reduced by 2030.

### How?

Update and complete the city waste segregation plan (Decision No. 1577/QD-UBND dated April 11, 2019); Develop and implement pilot projects to reduce plastic waste generation at all levels, including community groups, commercial sectors, schools, tourism facilities, agri- and aquaculture and healthcare facilities.



## Move from waste management to circular economy solutions

### Why?

Establishing a circular economy policy with ambitious targets will create opportunities for innovation and experimentation with different circular economy solutions.

### How?

Support implementation of pilot projects, including research and communications, to introduce new products and promote lifestyle changes to prevent plastic waste.





### Strengthen the capacity of local bodies

#### **Why?**

Da Nang City government is responsible for waste management down to district and ward-level institutions and should build capacity for city-wide action.

#### **How?**

Complete training and awareness-raising on plastic waste management for public officials and employees; Support inspection of plastic packaging activities in city markets by individuals and organisations.



### Public and private sector participation

#### **Why?**

Behaviour change is needed to reduce the consumption of single-use plastic items by citizens and businesses; Private sector involvement in plastic pollution mitigation is currently limited and could increase operational efficiency and outreach.

#### **How?**

Campaigns to raise awareness of plastic pollution with information, education and communication materials and guidelines at all levels. In particular, targeting residential communities, public procurement officials, school children, tourism facilities and agri- and aquacultures; Promote and incentivise the development and use of reusable alternatives to single-use plastic products.



### Resource mobilisation

#### **Why?**

The current budget may struggle to improve plastic waste management operations. Circular economy solutions can offset costs and help extract maximum value from waste products.

#### **How?**

Mobilise domestic and international resources for technical support and technology development to reduce plastic waste generation and leakage.



### Use of digital tools, data management

#### **Why?**

Regularity of data updates and monitoring plans can help in tracking progress and evaluating solutions.

#### **How?**

Integrate remote sensing with AI technology developed under Closing the Loop project into plastic waste monitoring plans to monitor and map plastic waste hotspots from land to sea.



## CHAPTER 1

# Introduction

This short document summarises a baseline report conducted under the Closing the Loop Project (see Section 2.1). The baseline report provides a qualitative and quantitative analysis of plastic pollution in Da Nang in order to support the development of a city level action plan to reduce plastic pollution. The first part of the report quantifies plastic pollution in Da Nang, with detailed breakdowns of the types, sources, pathways and final destinations, or sinks, of plastic pollution. This helps to identify the specific policy goals unique to Da Nang to achieve reductions in plastic pollution.

The second part of the report provides a qualitative analysis of the context around plastic pollution, including existing policies, key stakeholders and a capacity assessment. This information helps to determine how the city should design an action plan to achieve the policy goals.

These sections combined provide the basis for the policy recommendations to consider in the development of the action plan. These are presented as a summary at the start of the report, with links to the evidence base.





## CHAPTER 2

# An Introduction to Plastic Pollution

Plastic pollution presents a tremendous environmental challenge and requires an urgent global response. Without action, the annual flow of plastic into the oceans will triple by 2040, reaching 29 million metric tonnes (Mt) per year<sup>1</sup>. Currently, only 9% of global plastic waste is recycled, 12% is incinerated and the remaining 79% is piled in landfills or unmanaged in cities, rivers, oceans and forests<sup>2</sup>. Fast-growing cities with weak waste management systems in East Asia, South Asia and China are responsible for about 60% of plastic waste leakage<sup>3</sup>. Ocean plastics cost the tourism, fishing, and shipping industries in the Asia-Pacific region US \$10.8 billion per year<sup>4</sup>.

The lack of effective policies, technologies and capacities to manage plastic waste at a local level has regional and global consequences. More actions are required to improve plastic waste management in the ASEAN region, influence consumer behaviour and build a circular economy across the waste value chain. Tackling plastic waste protects the oceans and creates social and economic development opportunities. Within the framework of the 2030 Agenda, integrated approaches across Sustainable Development Goals (SDGs) 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production) and 14 (Life below Water) with specific targets on plastic waste and pollution are urgently needed.

<sup>1</sup>PEW Charitable Trusts and SystemIQ. 2020. Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution. <https://www.pewtrusts.org/en/research-and-analysis/articles/2020/07/23/breaking-the-plastic-wave-top-findings>

<sup>2</sup>Geyer, R., Jambeck, J., Law, K. 2017. Production, use, and fate of all plastics ever made. Sci. Adv. 3. <https://advances.sciencemag.org/content/3/7/e1700782>

<sup>3</sup>Jambeck, J., Geyer, R., Wilcox, C., Siegler, T., Perryman, M., Andrady, A., Narayan, R., Law, K. 2015. Plastic waste inputs from land into the ocean. Science. 347. 6223. <https://science.sciencemag.org/content/347/6223/768>

<sup>4</sup>McIlgorm, A., Raubenheimer, K., McIlgorm, D. 2020. Update of 2009 APEC report on Economic Costs of Marine Debris to APEC Economies. A report to the APEC Ocean and Fisheries Working Group by the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong. <https://www.apec.org/Publications/2020/03/Update-of-2009-APEC-Report-on-Economic-Costs-of-Marine-Debris-to-APEC-Economies>





## 2.1 Closing the Loop: Scaling Up Innovation to Tackle Marine Plastic Pollution in Cities

*Closing the Loop: Scaling up Innovation to Tackle Marine Plastic Pollution in Cities*, a project by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) with support from the Government of Japan, aims to reduce the environmental impact of cities in the ASEAN region by addressing marine plastic pollution.

In line with the ASEAN Framework of Action on Marine Debris, the G20 Osaka Blue Vision and national policies and action plans, this project assists four cities: Da Nang, Viet Nam; Kuala Lumpur, Malaysia; Surabaya, Indonesia and Nakhon Si Thammarat, Thailand (Figure 1). These cities are developing action plans to make plastic waste management more circular and reduce plastic waste entering the marine environment from land-based sources.

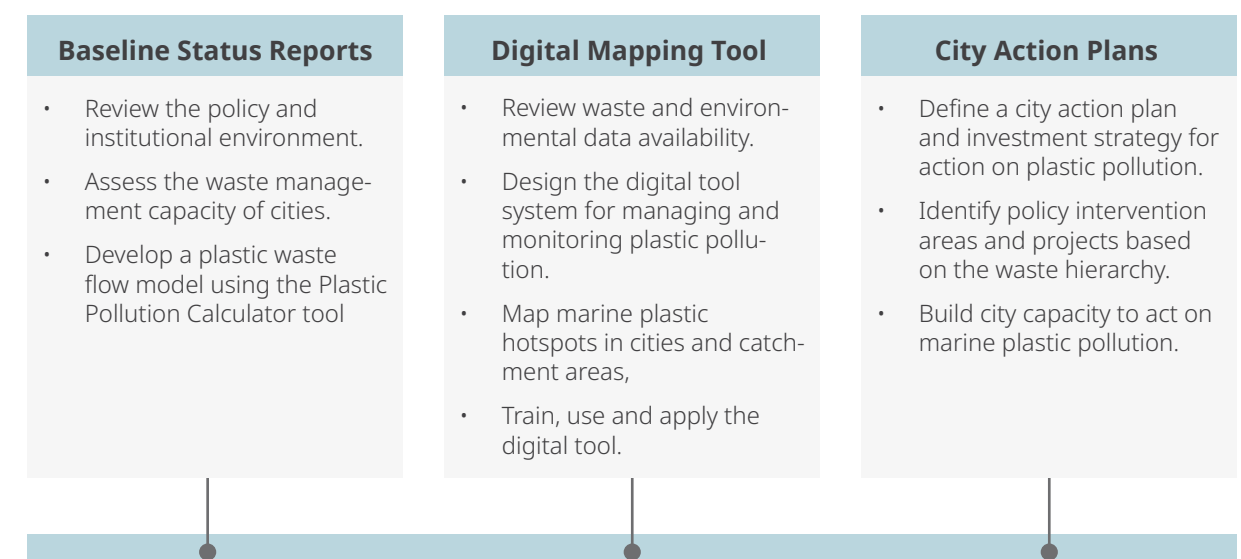


**Figure 1** Closing the Loop Pilot Cities



Closing the Loop also builds local capacity and technical expertise, supporting city governments and their partners to monitor and visualise plastic waste and identify hotspots to improve management. It raises awareness of marine litter and the solutions cities are taking to improve plastic value chain management, promote behavioural change among consumers and industry and create enabling environments for policy development.

### Three Steps to Circular Plastic Waste Management





## CHAPTER 3

# Da Nang City, Viet Nam

Da Nang City is the largest urban centre and economic hub of Central Viet Nam. It has a total land area of 1,285 km<sup>2</sup>, located on the coast of the Eastern Sea at the mouth of the Han River. Da Nang City is a dynamic port with approximately 90km of coastline.

The total population of Da Nang City was approximately 1.14 million people in 2019, increasing 2.4% since 2018. Out of the mainland population, 87.2% live in the urban districts, and 12.8% in the rural district. The average population density in Da Nang City is 1,165 people/km<sup>2</sup>, which is lower than Ho Chi Minh (4,363 people/km<sup>2</sup>) and Ha Noi (2,398 people/km<sup>2</sup>).

Over the past decade, Da Nang City has recorded remarkable progress in achieving economic development with an average annual GDP growth rate of 10%. The City is expected to account for 2.8% of the national GDP and is estimated to reach a per capita GDP of US \$4,500 – 5000 at the end of 2020<sup>5</sup>.

Da Nang City's economy historically has been dominated by the industrial and construction sectors. However, this has now transitioned towards the trade and service sectors, accounting for 56.17% in 2018<sup>6</sup>. Due to its strategic location, growing workforce and local economic incentives, Da Nang City is subject to extensive foreign investment in many sectors, expecting 57 new initiatives by 2025, including industrial infrastructure, information technology, education and tourism services.

The tourism sector reached a remarkable growth rate of 13.4% in 2019 though COVID-19 greatly impacted this in 2020<sup>7</sup>. The tourism activities primarily concentrate in Son Tra, Ngu Hanh Son and Thanh Khe districts along the river and coastline. Hai Chau district is the administrative centre, and Lien Chieu and Cam Le districts focus more on developing industrial activities. Hoa Vang is the main agricultural area of the City.

<sup>5</sup>Da Nang City Government. 2019. Statistical Year Book of Da Nang city.

<sup>6</sup>DONRE. 2019. Report of Environmental Situation of Da Nang in 2019 – Theme: “SWM”

<sup>7</sup>VGP News - Online Newspaper of the Government, December 2019

<http://news.chinhphu.vn/Home/Da-Nang-strives-to-welcome-98-million-tourists-next-year/201912/38381.vgp>





## CHAPTER 4

# Methodology

This summary combines two assessments of the plastic waste management system in Da Nang City.

## Physical Assessment

- Assessing plastic waste generation, collection, recycling and treatment.
- Using the Plastic Pollution Calculator (PPC) developed by the University of Leeds and ISWA the City quantifies plastic pollution.

## Governance Assessment

- Evaluation of city and national policies related to plastic waste management.
- Assessment of stakeholder participation, financial sustainability and digital readiness for managing plastic waste in the city.

## 4.1 The Plastic Pollution Calculator (PPC)

The Plastic Pollution Calculator (PPC)<sup>8</sup> is an international waste modelling methodology developed by the International Solid Waste Association (ISWA) and the University of Leeds. The PPC has been applied to Da Nang City at a district level. It uses a comprehensive Material Flow Analysis (MFA) approach to quantify plastic pollution sources, sinks and pathways (Figure 2). This method integrates the many different factors controlling plastic pollution, including waste composition, topography, infrastructure quality, local socio-economic conditions, climate and waste management practices. A digital elevation model and flow routing algorithm are then applied to map the pathways that plastic waste enters the environment, including modelling surface runoff and entry points.



**Figure 2** Material Flow Conceptual Framework (MFA) of the Plastic Pollution Calculator (PPC)

<sup>8</sup>University of Leeds. n.d. ISWA Plastic Pollution Calculator Toolkit.  
<https://plasticpollution.leeds.ac.uk/toolkits/calculator/>

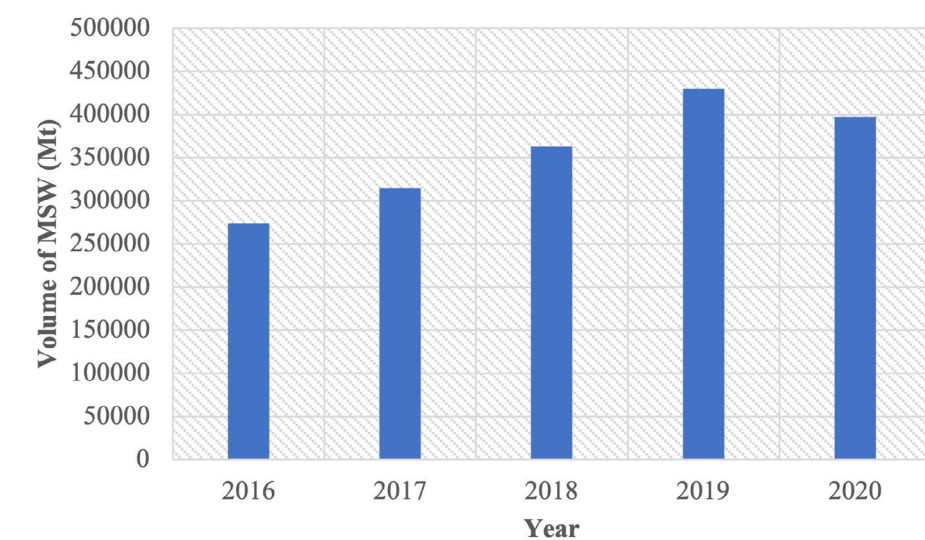


## CHAPTER 5

## Results

## 5.1 Municipal Solid Waste Management

Municipal waste generation in Da Nang City has been steadily increasing alongside strong economic development. The average municipal solid waste (MSW) generation rate increased by 15-16% from 2016 to 2020<sup>9</sup>. As of 2019, MSW generation in the City was approximately 1.177 tonnes per day, yet dropped 8% to 1.078 tonnes per day in 2020 due to the impacts of COVID-19. Based on a regular development forecast, the City will generate 1.794 tonnes per day by 2030 and 2.450 tonnes per day by 2045. While waste management collection, transport and treatment services have improved to cover an average of 95% of waste generated in Da Nang City in the last five years, it is still not enough to solve their plastic pollution problem.



**Figure 3** Volume of Municipal Solid Waste Generated per year in Da Nang City  
The MSW generation in Da Nang has increased over recent years until COVID-19 impacts on international tourism and economic activity reduced 2020 generation<sup>10</sup>.

<sup>9</sup>Da Nang Department of Natural Resources and Environment (DONRE), 2021. The current state of environment in Da Nang city in the period 2016 - 2020.

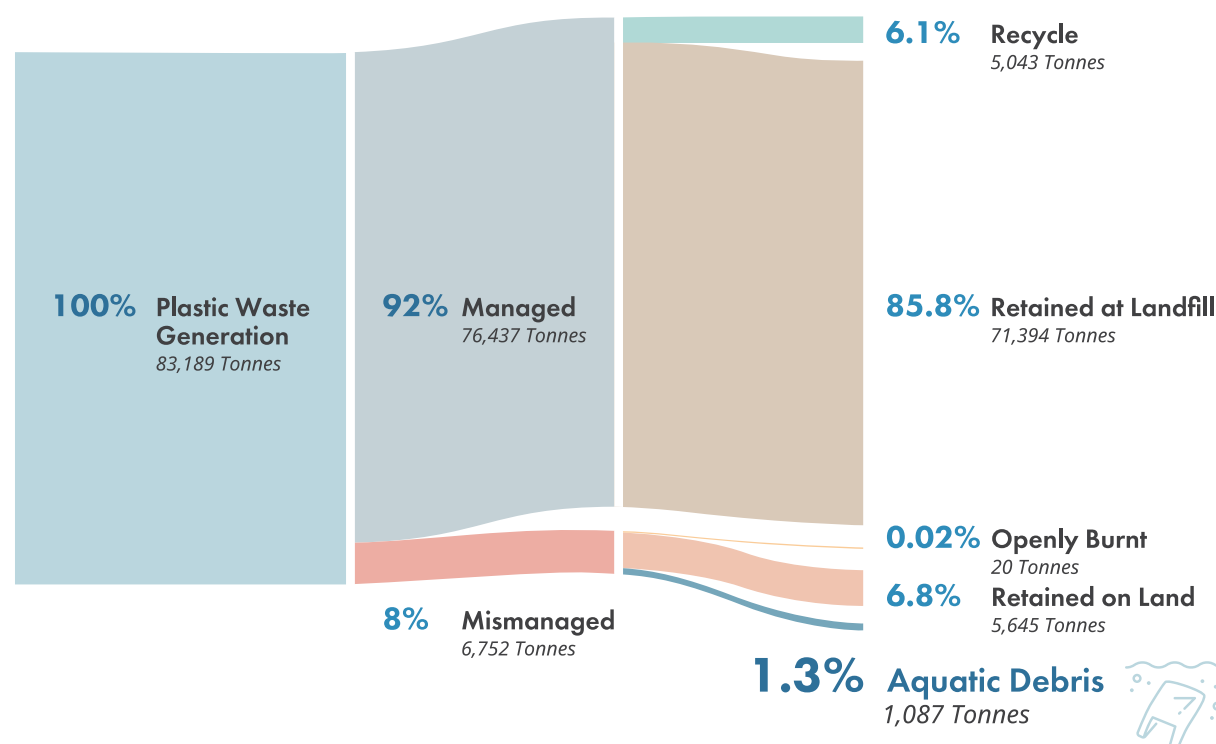
<sup>10</sup>Ibid.



## 5.2 The Plastic Waste Management Value Chain

An overview of the fate of plastic waste within Da Nang City is summarised in Figure 4. Overall, 85.8% of plastic waste ends up at the disposal site where it is retained, only 6.1% of the plastic is sorted for recycling and about 8% of plastic waste is unmanaged. This unmanaged plastic waste stream has a high potential to damage the local environment and ecosystems and accounts for an estimated 6,752 tonnes of plastic waste per year.

Of this, 5,043 tonnes are retained on land, while 1,087 tonnes enter the aquatic and marine environment. This aquatic unmanaged plastic waste is equivalent to 1.3% of overall waste and many millions of plastic waste items. Over time and without clean-up activities, this plastic will degrade, breaking down into innumerable micro-plastics which are extremely difficult to recover. Another 20 tonnes is openly burnt, contributing to urban air pollution.

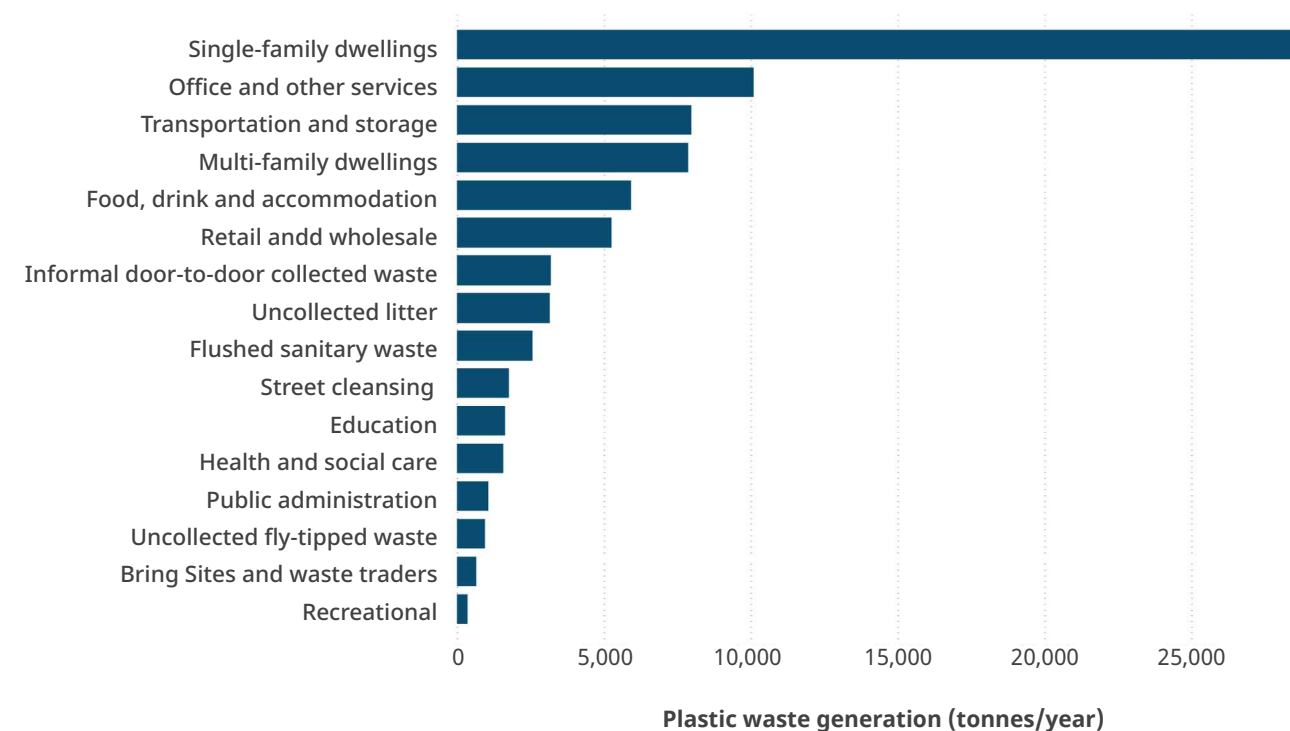


**Figure 4** The Fate of Plastic Waste in Da Nang City  
1.3% of plastic waste becomes aquatic debris

## 5.3 Key Sources of Plastic Pollution

The physical properties of plastic waste and the economic activities driving waste generation are critical factors to identify the most effective interventions to reduce plastic pollution.

Residential activities, particularly single-family dwellings, generate the highest volume of plastic waste in Da Nang City, followed by private sector offices and service buildings (Figure 5).

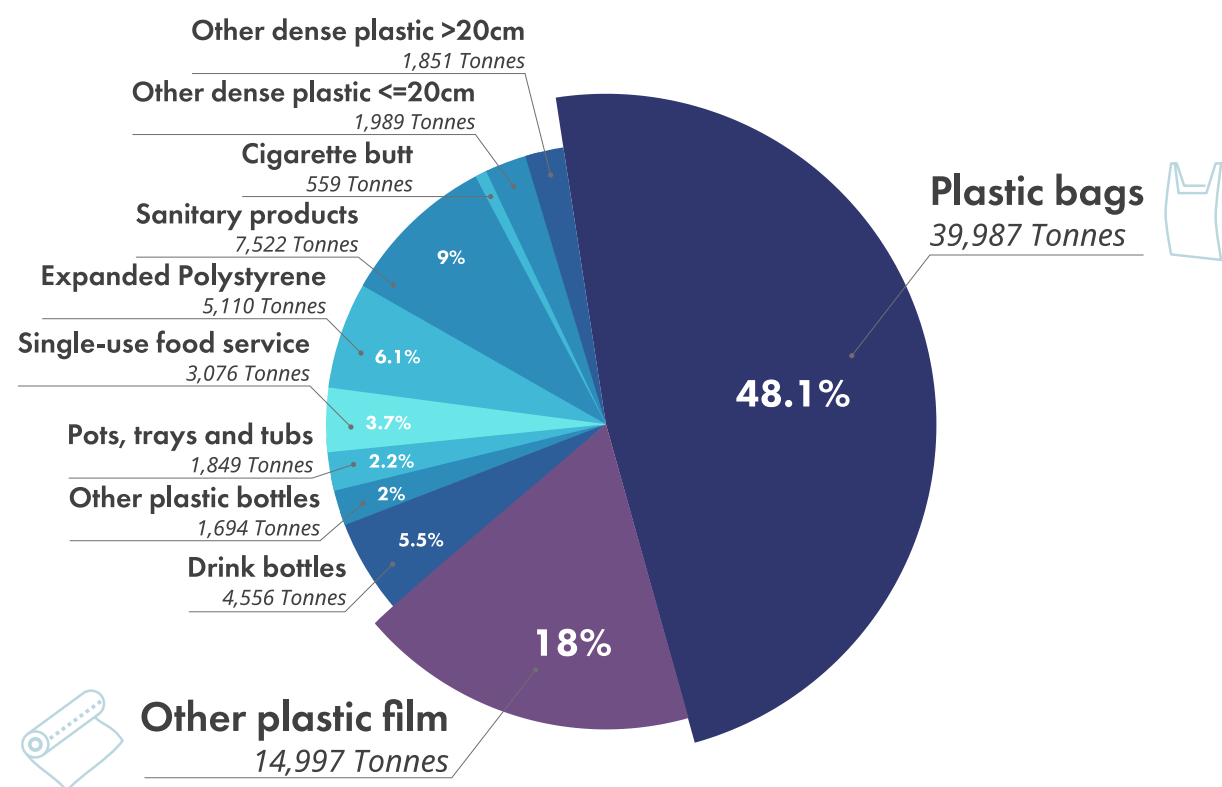


**Figure 5** Plastic Waste Generation by Activity  
Residential activities are a major driver of plastic waste generation in Da Nang City



Primary data collection also investigated plastic waste generation in the context of COVID-19. However, this category consisting of personal protection equipment (PPE) only accounted for 0.16% of MSW or 0.86% of plastic wastes sampled.

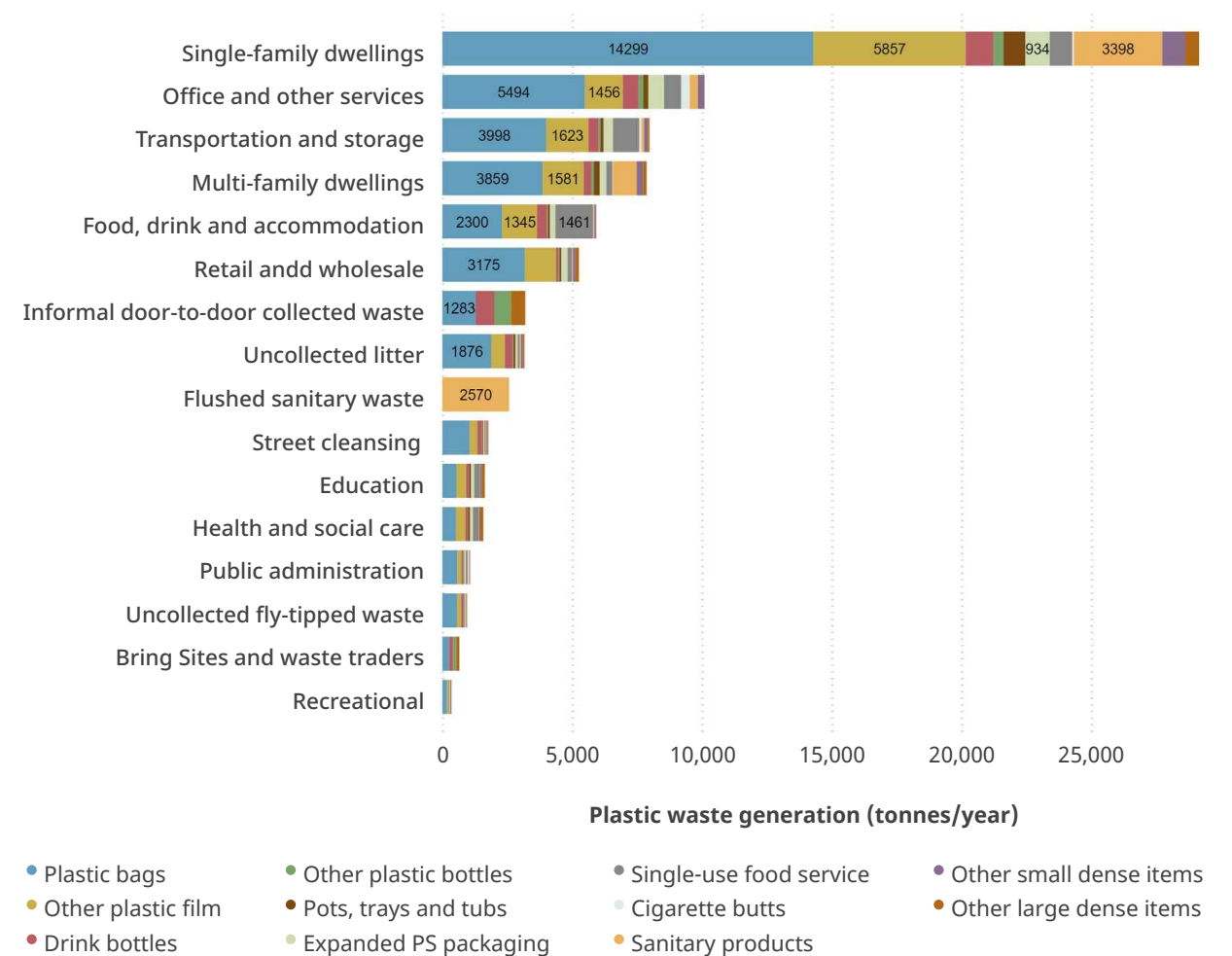
Plastic bags account for 48.1% of all plastic waste generated in Da Nang (Figure 6). In addition to plastic bags, other plastic films are also relatively high at 18%. Therefore, most of Da Nang City's plastic waste is lightweight plastic products that commonly have low value and are susceptible to leakage. While plastic products with a higher value are more commonly recycled and are a much smaller percentage of plastic litter.



**Figure 6** Plastic waste composition at source per year  
Plastic bags and films make up most of the plastic waste in Da Nang City



The use of plastic bags is widespread, and they are highly prevalent in the plastic waste composition. Commercial activities contribute vast amounts of plastic bags, plastic films and single-use foodservice items to the waste stream. Similarly, residential households produce large quantities of plastic bags but also high amounts of other products, including cleaning bottles and sanitary products (Figure 7).



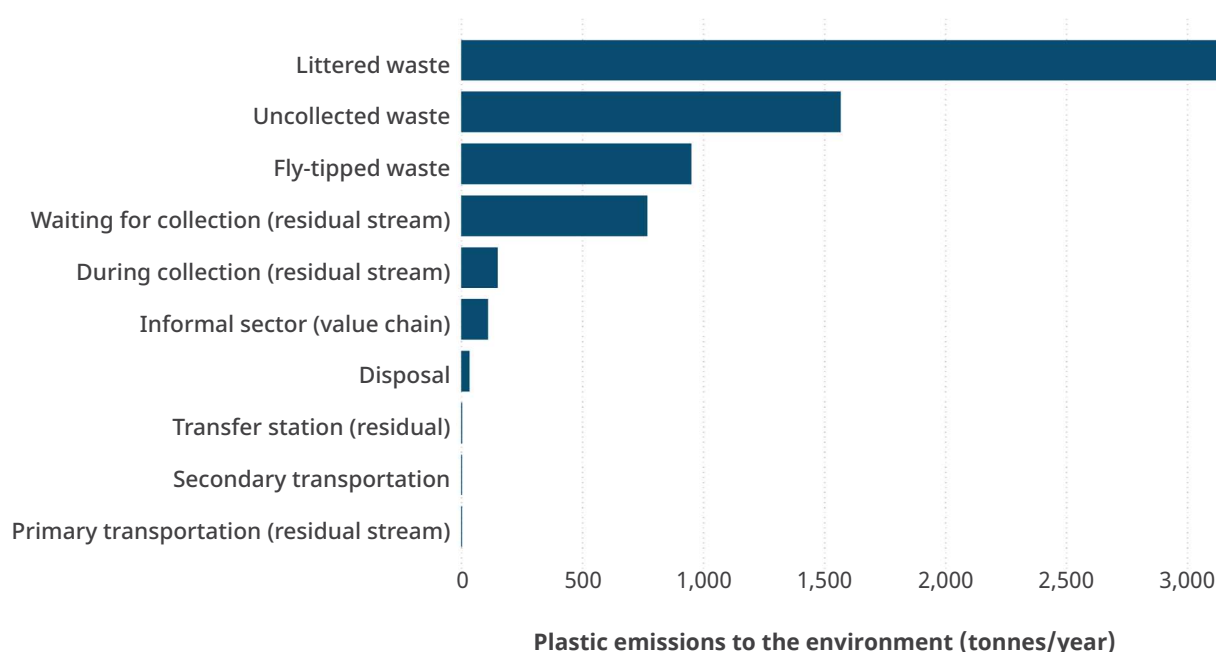
**Figure 7** Plastic waste composition by detailed activity  
Residential activities produce a diverse range of plastic waste products. For most activities plastic bags account for almost half of all plastic emissions.



## 5.4 Key Pathways of Plastic Pollution

The plastic emission pathways to the environment for Da Nang City are shown in Figure 8. Littering is the most prominent emission pathway for plastic entering the environment, accounting for 3,156 tonnes of plastic waste a year. This is equivalent to approximately 7 grams of plastic littered per person per day or about one plastic bottle a day per person. Efforts are needed to address both individual habits

and infrastructure issues around littering. Leakage from uncollected waste accounts for the second-largest emission pathway in Da Nang, releasing 1,568 tonnes of plastic waste a year. Despite Da Nang City achieving relatively complete collection coverage, >95% in Thanh Khe, Hai Chau, and Son Tra; 95% in Lien Chieu, Cam Le and Ngu Hanh Son and 90% in Hoa Vang rural district.

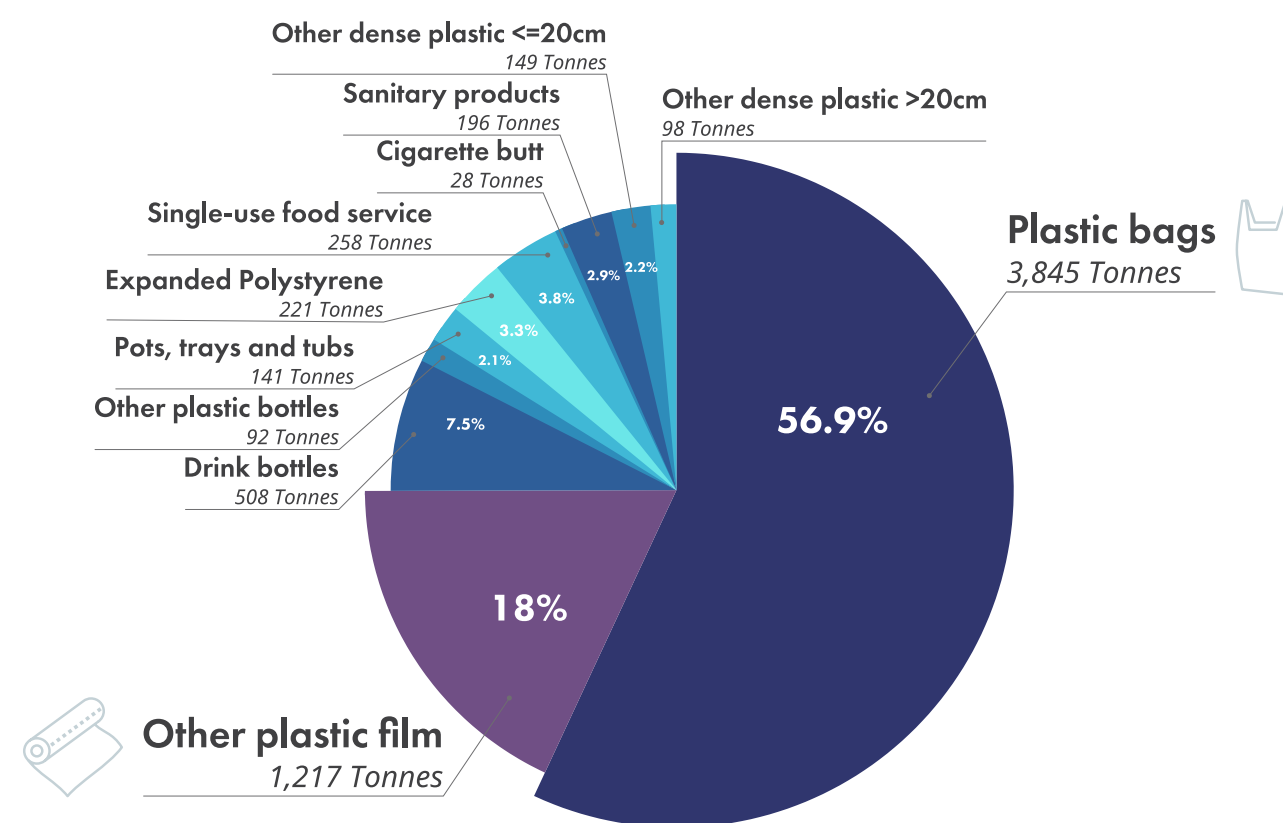


**Figure 8** Key pathways of plastic emissions to the environment  
Littered and uncollected waste are the main pathways plastic emissions enter the environment

Following uncollected waste, both 'fly-tipping' and 'waiting for collection (residual stream)' are the next largest sources of plastic pollution, with quantities of 951 and 769 tonnes per year, respectively. The damaged, dilapidated and overflowing collection containers in some districts are among the causes of this source's mismanagement.

## 5.5 The Composition of Plastic Emissions in the Environment

Unsurprisingly, plastic waste released to the environment is still primarily dominated by plastic bags, accounting for 56.9% of all plastic released, followed by plastic films (18%) and plastic bottles (7.5%) (Figure 9). Notably, the release of plastic bags and films fluctuates greatly over time due to their lightweight and low density, making them highly susceptible to movement.



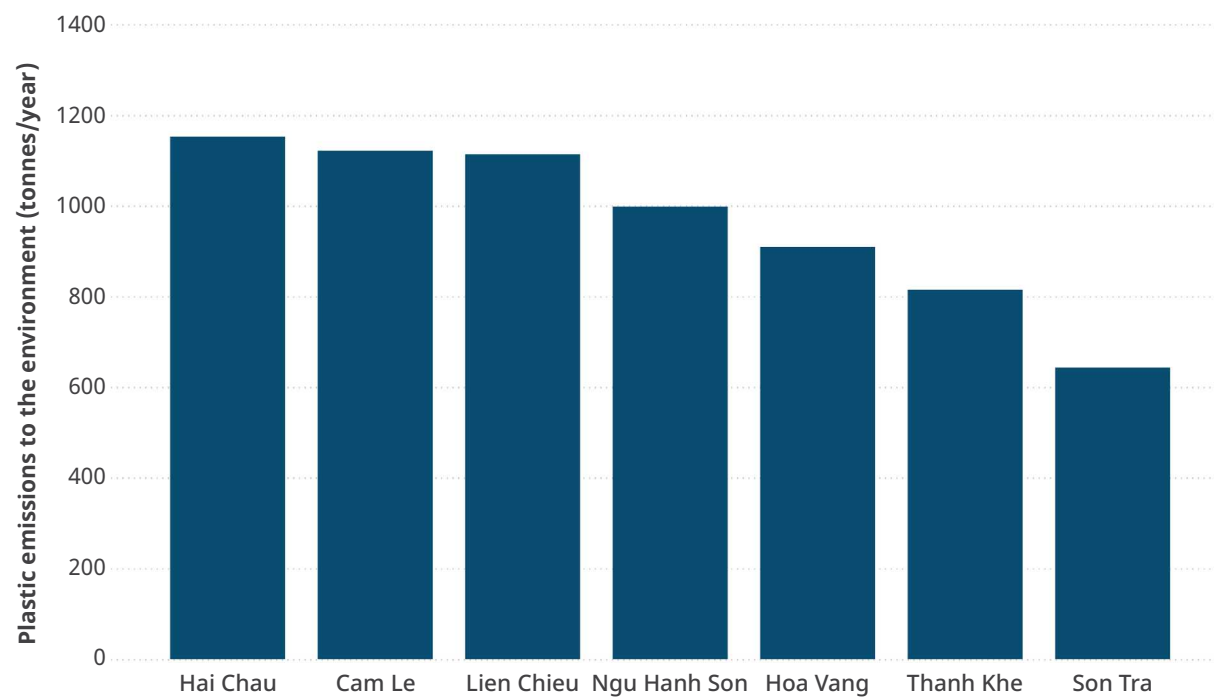
**Figure 9** Waste Composition of Plastics in the Environment  
Lightweight and cheap plastic products dominate plastic pollution in the environment.



## 5.6 Spatial Distributions of Plastic Pollution Emissions

Figure 10 shows the total plastic emissions to the environment in tonnes per year for each district. Hai Chau, Cam Le and Lien Chieu are considered the highest plastic emitters, producing an estimated 1,152, 1,122 and 1,113 tonnes per year, respectively. Hai Chau has a high population and is a focal point for commercial activities such as markets, leading to increased littering and plastic pollution.

Lien Chieu and Cam Le have similarly high urban populations, collection coverage of less than 100%, and limited waste management infrastructure. Son Tra, Thanh Khe and Hoa Vang were calculated as having the lowest plastic emissions. For Son Tra and Thanh Khe, their low plastic emissions are mainly due to the relatively well functioning waste management system. On the other hand, Hoa Vang has low emissions due to its small residential population, even though much of this waste is fly-tipped waste.



**Figure 10** Plastic Emissions to the Environment by District  
Hai Chau, Cam Le and Lien Chieu districts have the highest environmental plastic emissions.





## CHAPTER 6

# A Review of Plastic Waste Governance and Policy

The second assessment reviewed four dimensions of plastic waste governance and policy-making in Da Nang:

- **Proactive Policies and Sound Institutions**

Are there adequate national and local policies, legal frameworks, and enforcement mechanisms to tackle plastic pollution in Da Nang City?

- **Stakeholder Participation and Inclusivity**

How are local stakeholders involved in the plastic waste value chain in Da Nang City, and to what degree are they included in policy planning implementation and evaluation?

- **Financial Sustainability**

Are city waste management services adequately resourced, including ensuring cost recovery and long-term financial planning?

- **Digital Readiness**

How is Da Nang City applying new digital technologies to enhance waste governance and citizen engagement?

## 6.1 Institutional Governance of Plastic Waste Management

The Ministry of Natural Resources and Environment (MONRE) is responsible for waste management at the national level, according to Decree 09/NQ-CP dated 2019 on unifying state administration. In addition, many other line ministries are involved in waste management, including the:

- Ministry of Construction
- Ministry of Industry and Trade
- Ministry of Agriculture and Rural Development
- Ministry of Health
- Ministry of Culture, Sports and Tourism
- Ministry of Planning and Investment
- Ministry of Finance

In Da Nang City, the Department of Natural Resources and Environment (DONRE) is the focal point for MSW and collaborates with relevant departments according to their functions and tasks, such as the Department of Planning and Investment, Department of Construction, Department of Agriculture and Rural Development Department of Culture, Sports and Tourism. Youth Clubs and Women Union of the City also actively participate in the communications and raising awareness activities on MSW management. The Urban Environment Company (URENCO) is the leading state-owned company in charge of waste collection, transport, and treatment operations in the City.



In addition to the state agencies, the informal and private sectors and local and international organisations all play key roles in plastic waste management, reviewed in the following table.

### Key Waste Management Stakeholders in Da Nang City

Informal Sector	The informal sector is formed of decentralised independent waste pickers and small-scale scrap shops
Private Sector	Packaging Recycling Organization (PRO), Coca-Cola (Da Nang Ekocenter), Coin for Change, DANAPLAST – Danang Plastic Joint Stock Company, Evergreen Labs
NGOs	Viet Nam Plastics Association (VPA), Centre for Environment and Community Research (CECR), Center for Consultancy on Sustainable Development (C4SD), Pacific Environment – Viet Nam Zero Waste Alliance, Greenhub, GreenViet
Community-based Organisations	Youth Clubs, Women Union
International Organisations	International Union for Conservation of Nature (IUCN), World Wildlife Fund (WWF), United States Agency for International Development (USAID), Japan International Cooperation Agency (JICA), United Nations Development Programme (UNDP), International Relief and Development (IRD)
State Agencies	Ministry of Natural Resources and Environment (MONRE), Department of Natural Resources and Environment (DONRE)
Waste Operators	Urban Environment Company (URENCO)

## 6.2 National Policies and Legislation

In response to the rising amount of plastic waste, the national government has introduced many new policies and laws to control plastic pollution. *The National Action Plan for Management of Marine Litter by 2030* was approved by the Prime Minister (Decision 1746/QĐ-TTg) in 2019 to implement the country's initiatives effectively and meet international commitments to address plastic waste, as seen in the following table.





## Key targets in the National Action Plan for Management of Marine Litter by 2030

Targets	By 2025	By 2030
Reduce marine plastic litter	50%	75%
Collect abandoned, lost, or discarded fishing gear	50%	100%
Prevent the use of single-use plastics and non-biodegradable plastic bags in coastal tourism areas, tourist attractions, accommodations and other seaside tourism services	80%	100%
Strive for marine protected areas to be free of plastic litter	80%	100%
Monitor marine plastic litter annually and assess marine plastic litter every five years at many estuaries in the major drainage basins	5 major drainage basins in 12 insular districts	11 major drainage basins and in the 12 insular districts

In addition, the Prime Minister's Directive No. 33/CT-TTg dated August 2020 on strengthening the management, reuse, recycling, treatment and reduction of plastic waste aims to reduce the consumption of single-use plastics and promote eco-friendly alternatives.



The other policies and plans related to waste management (including plastic waste) are as follows:

- National Strategy on Integrated Solid Waste Management by 2025, with a Vision towards 2050
- Viet Nam Socio-Economic Development Strategy for the Period of 2011-2020
- The 2020 Law on Environmental Protection
- National Strategy for Environmental Protection until 2010, and Vision Toward 2020
- Law on Water Resources (2012)
- National Action Plan for the Implementation of the 2030 Sustainable Development Agenda (2017).

Da Nang City has not yet issued a separate policy or legislation focusing on plastic waste management but has several local waste management plans that set some general goals, including:

- Da Nang City Plan on the Implementation of Waste Segregation at Source to 2025
- Plan for Solid Waste Treatment until 2030, with a Vision Towards 2045
- Building Da Nang City - Environmental City Plan for the Period of 2021 - 2030
- Da Nang City Socio-Economic Development Master Plan to 2020, with a Vision to 2030

Many of these are implemented at a district level. For example, in Thanh Khe district, the Plastic Smart Cities project collaborates with DONRE to plan, issue and implement the plan on plastic waste management by 2025.





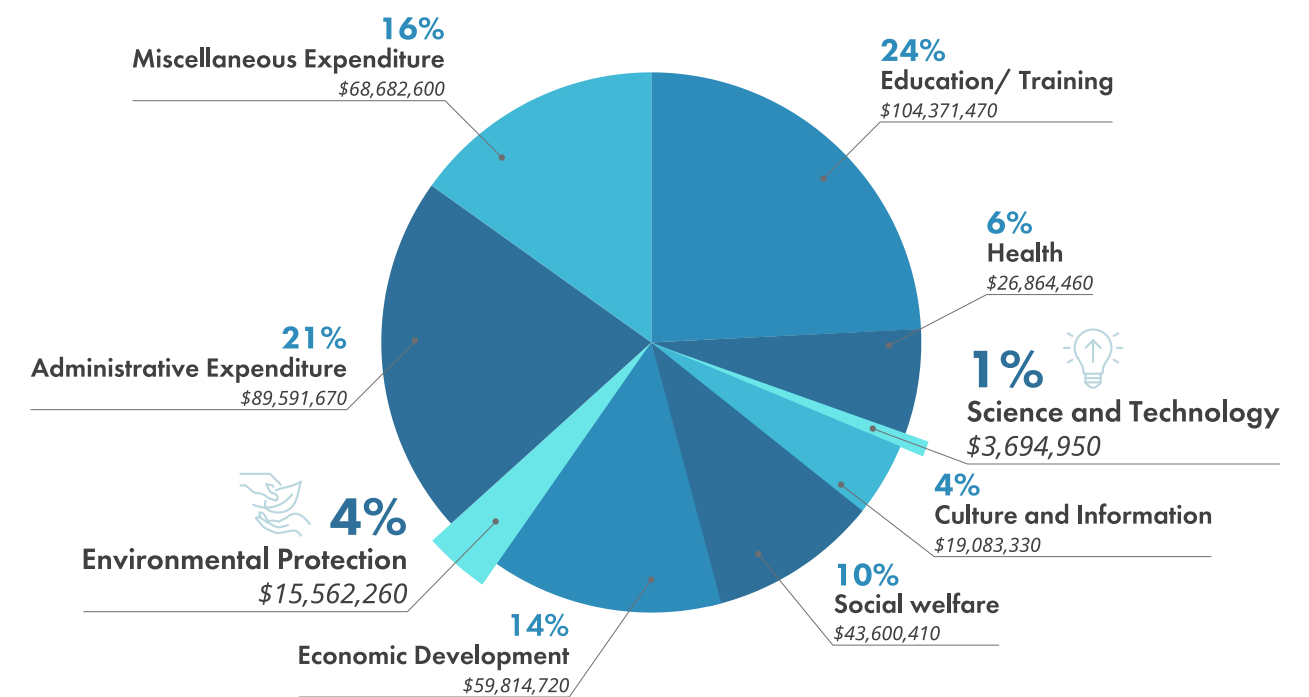
## 6.3 Financial Sustainability

The local revenue of Da Nang City has been steadily increasing with the growth of the local economy and was estimated to reach 26.7 trillion VND in 2019 (\$1.16bn US). Of the total operating expenditure of 9.9 trillion VND (\$431m US), Da Nang spent 358 billion VND (\$15.6m US) on environment protection and 85 billion VND on Science and Technology in 2019 (\$3.69m US).

The operating expenses of the waste service provider URENCO come from household and corporation environmental fees. The City People's Committee determines the unit price based on the total amount of waste collected.

### Key Targets Set by Da Nang City

	By 2020	By 2025	By 2030	By 2050
<b>Da Nang City Solid Waste Treatment Planning until 2030, vision 2050</b>			100% domestic waste collection and treatment 90% of waste reuse, recycle and compost 100% waste separation at source	95% of waste reuse, recycle and compost
<b>Da Nang City Action Plan on the Implementation of Waste Segregation at Source</b>	12% of waste reuse and recycle	15% of waste reuse and recycle		
<b>Developing Da Nang – an Environmental City Plan</b>	15% of waste recycling			
<b>Da Nang City Socio-Economic Development Master Plan, 2030</b>	95%-98% of waste collection 70% of waste recycle	100% waste collection		



**Figure 11** Da Nang State Expenditure during 2019  
Environmental Protection and Science and Technology only account for 5% of the Da Nang City spending



## 6.4 Digital Readiness

Technology is playing an increasingly important role in optimising waste management and detecting waste leakage into the environment. Da Nang City is one of the first cities in Viet Nam to begin smart city development in alignment with the National Sustainable Smart City Development Plan (2018-2025). The Da Nang City Socio-Economic Development Master Plan, 2030 also sets the goal for Da Nang City to become a smart city. The City has introduced new information technologies to enhance effective public services. Its government program aims to improve efficiency for 21 public services, such as the bus management system with cruise monitoring equipment; the centre for managing and operating traffic signals; public transport monitoring system; early warning system for drinking water quality and supply; school management software; hospital management software and food safety and hygiene database. In addition, the City has launched the first stage of the 341ha Da Nang Information Technology Park (DITP) – central Viet Nam's 'Silicon Valley' - with a total investment of US \$278 million.

The established digital systems in Da Nang City illustrate a high technological capacity and scope for onboarding new digital solutions to address plastic pollution. Innovation in the waste management sector opens new ways to prevent, reduce and even eliminate plastic waste. These innovations can also advance resource recovery, achieve high treatment and disposal standards, and reduce pollution and environmental impacts. At the same time, it provides new tools to promote stakeholders' interaction, awareness, and citizens' participation; to apply the "polluter pays" and the "extended producer responsibility" principles; to make the policy development process more inclusive and participatory; and to reduce dangerous jobs and occupational health and safety risks.





## CHAPTER 7

# Conclusions and Recommendations

Sections 2 to 7 provide an evidence base to support a city level action plan. The quantitative results in sections 2 – 5 provide insights into how much plastic pollution occurs in Da Nang City. They also provide insights into the most important products, sources and causes of plastic pollution, which form policy priorities for the city action plan. Section 6 provides the context around plastic pollution, the policy frameworks that already exist and the roles of stakeholders and overall capacity to address aspects of plastic pollution.

These have been used to develop a long list of policy recommendations, which can be found at the start of this document. These policy recommendations are not definitive, but provide a wide basis on which to consult key stakeholders in the development of the final city action plan.

Eliminating plastic pollution is the overall goal of international frameworks, such as the Osaka Blue Ocean Vision, the ASEAN Framework of Action on Marine Debris, and broader policy frameworks, such as the Sustainable Development Goals. However, achieving this global goal will only be possible if each city takes tailored and targeted evidence-based action. It is hoped that this report will support stakeholders take action at the city level in Da Nang to support of these common goals.





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