Can Tho, Vietnam

City Waste Management Profile

URBAN OCEAN

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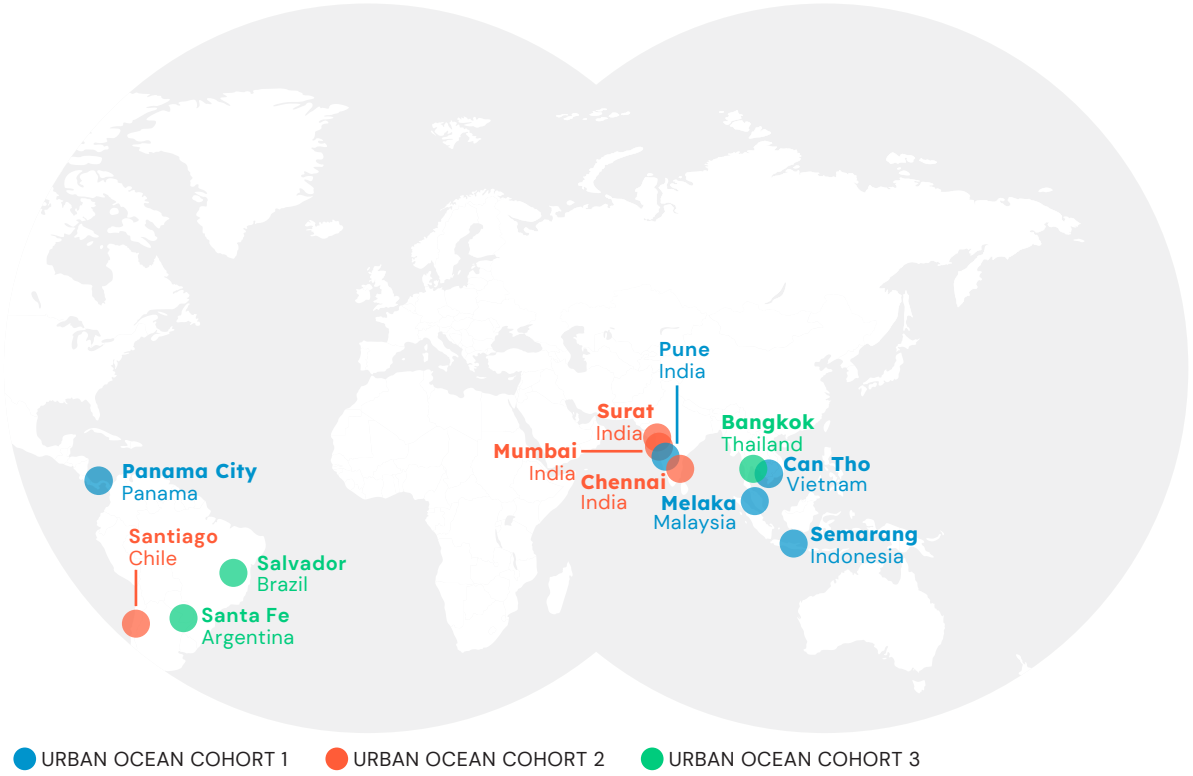
1. Introduction to Urban Ocean

Urban Ocean is a capacity-building and accelerator program for cities that champions circular economy principles, builds awareness of ocean plastic pollution, and assesses waste management systems. The program leverages city leaders to bring new ideas, partners, and resources together and solve interrelated resilience challenges related to: waste management; plastic leakage; and protecting water bodies and the ocean. The program demonstrates how actions to improve waste management and recycling can provide resilient and sustainable solutions that reduce ocean plastic pollution while addressing key city priorities, such as improving public health, supporting economic development, and reducing greenhouse gas emissions. Furthermore, Urban Ocean provides cities with the opportunity to demonstrate thematic leadership and share knowledge and experience across the Resilient Cities Network (R-Cities) community and beyond. The program is jointly led by R-Cities, Ocean Conservancy (OC), and The Circulate Initiative (TCI).

Figure 1
Urban Ocean cities map



Overview of the Urban Ocean Challenge

Cities are home to over half of the global population and account for nearly three-quarters of global greenhouse gas (GHG) emissions (IPCC, 2021). No climate nor social target will be met without a deep transformation of urban centers towards a more inclusive, sustainable, and resilient path. Approaching urban waste management systems through a resilience lens reveals complex, interrelated ramifications for social, economic, and environmental indicators. In 2018, the International Labor Organization estimated that the waste management sector alone has the potential to create 45 million jobs globally by 2030 while reducing GHG emissions by 15 to 20%.Additionally, circular economies offer a USD 4.5 trillion economic opportunity by reducing waste, stimulating innovation, and creating employment by 2030 (WRI, 2021). Currently, plastic usage is growing and continues to be a threat to public and environmental health in the ocean and in cities. A huge opportunity exists for city governments to implement policies and projects that promote a more resilient and circular waste sector in their cities. Now is the time to set out on the path towards a more resilient urban–ocean relationship that highlights the importance of preventing marine plastic debris.

Program objective

The Urban Ocean program aims to collaborate with urban leaders to gather new ideas, partners, and resources to address interconnected challenges related to resilience in waste management, reduce plastic leakage and protect water bodies and the ocean. Urban Ocean provides a platform for ocean advocates and urban leaders to join forces in developing comprehensive solutions that meet the needs and priorities of governments, cities, communities, and other stakeholders to create real and lasting impacts.

Cohorts 1 and 2

Urban Ocean works closely with cities to demonstrate tangible solutions and highlight progress in addressing waste management challenges. The first cohort of Urban Ocean cities included Pune (India), Can Tho (Vietnam), Panama City (Panama), Semarang (Indonesia) and Melaka (Malaysia).

The work further expanded to four additional cities in Cohort 2 – Chennai, Surat and Mumbai (all India) and Santiago (Chile) – to expand the geographic scope of the program, expand the waste management, circular economy and resilience ecosystem, increase collaboration with local governments and establish effective waste management systems that generate environmental, social and economic co-benefits to cities.

Methodology

This report provides a summary of the information collected for the purpose of developing a resilience-oriented analysis of the urban waste management system in Can Tho, Vietnam. The profile was conducted in collaboration with the Can Tho City Council, R-Cities, Ocean Conservancy (OC), The Circulate Initiative (TCI) and the Can Tho University. The analysis involved desk research, interviews and collaborative workshops with city stakeholders. The following table presents the key stakeholders who were consulted as part of the program.

Table 1
Interviewed stakeholders

Government/ public sector agencies

Department of Natural Resources and Environment, Can Tho City

Department of construction, and Environment, Can Tho City

People's Committee of Cai Rang district

People's Committee of Le Binh ward, Cai Rang district, Can Tho city

People's Committee of Phong Dien district

People's Committee of Truong Long commune, Phong Dien district, Can Tho city

NGOs

Green Mekong River Project

Academia

Research institute for Climate Change, Can Tho Univesity

School of Environment and Natural Resources, Can Tho Univesity

Waste service providers

CanTho Urban Construction Joint Stock Company

Private sector

Minh Thong Trading Service Company Limited

Son Trung Thanh Construction Enterprise

Civil Society

Cai Rang District Women's Union

Cai Rang District Youth Union

Cai Rang District Farmers' Association

Phong Dien District Women's Union

Phong Dien District Youth Union

Phong Dien District Farmers' Association

2. About the City Waste Management Profile

As part of Urban Ocean, cities create a City Waste Management Profile, in which a city's waste management systems are presented, including technical and sustainability aspects, and formal and informal actors in the system. The City Waste Management Profile ("the Profile") examines major disturbances and stresses prevalent in the city that impact the city's waste management system. It brings together preexisting data and information collected in the initial phases of the program to allow the city to assess the risks and vulnerabilities of the system, as well as support project design.

The Profile seeks to provide insight for the city to better plan and identify appropriate solutions to increase the resilience of their waste management system, reduce plastic leakage into the environment, and improve the city's ability to respond to, adapt to or otherwise address current and future shocks and stresses. It summarizes the baseline assessment conducted in all cities in the Urban Ocean program and highlights the most relevant data and information to address urban resilience, ocean conservation, and plastic pollution.

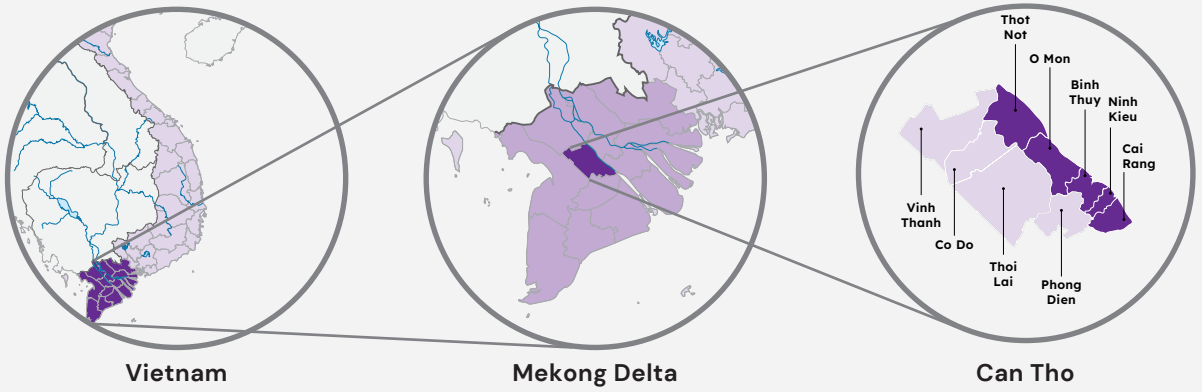
The Profile encourages a more holistic approach to existing challenges and supports cities in the development of individual solutions suited to their specific history, economy, demographics and culture while being aligned with the city's unique institutional, environmental, and financial resources. An added benefit of being part of Urban Ocean is how cities can learn from each other by comparing common elements in their respective Profile.

Source: Vietnam.travel

3. Overview of Can Tho and its Resilience Journey

Can Tho is the largest city in the Mekong Delta region of Vietnam and is the main center of commerce and investment in the region. It has a population of approximately 1.25 million people spread over five urban districts and four rural ones. The city is famous for its water and rice. Its once-productive agricultural sites currently struggle with anthropogenic changes, flooding, contamination, and displacement of farmers. Rapid urbanization and rising sea levels due to climate change have contributed to increased severe river flooding and waterborne disease.

Figure 2
Socio-demographic indicators



1.2 million
Population

859 per km2
Population density

1,438 km²
Area

21%
Population in informal housing

Source: Can Tho Statistical Yearbook 2020; No.280 decision Solid waste treatment planning of Can Tho city to 2030, vision to 2050.

City's connection with the waterbodies

Can Tho is the economic hub of the region. With ever increasing urbanization, Can Tho continues to face multiple shocks and stresses. These have been growing in frequency and intensity, and are difficult to predict.

A dynamic city with a dense network of interlacing rivers, channels and canals, which creates a distinctive riverscape, Can Tho is situated on the left bank of the Hau Giang River and 145 km southwest of Ho Chi Minh City. The section of the Hau Giang River in Can Tho City is about 60 km long and up to 1,500 m wide. The river system in Can Tho mainly facilitates commercial activities and is an important route for transporting goods such as food and other commercial products. This water system plays a major role in local people's lives and the city's economy, particularly for commercial activities and transportation routes. At the same time, the city faces substantial water and climate change challenges ranging from inadequate waste disposal and waste leakage in the river, chronic seasonal flooding in the rainy season, dry season droughts as well as water pollution and salinization.

Key shocks and stresses impacting the city's waste management systems

Economic modernization and industrialization, urban growth, increasing tourism and climate change present multi-faceted challenges for Can Tho. According to existing plans, Can Tho will be directed towards becoming

Figure 3
Map of Can Tho city

a developed city with inter-connected and modern infrastructure and linkages to Southeast Asia, and the central growth engine of the Mekong River Delta. The city strives to become a hub for tourism, trade and goods distribution, ecological and high-tech urban agriculture.[1] Living in a low-lying area, people in Can Tho have long been subjected to the impacts of flooding and inundation. In addition, over the past few years flooding has become less predictable. On top of these, the city has been facing many other challenges such as extreme heat waves, infectious disease epidemics, environmental pollution, water resource depletion and leakage of waste into the city's canals. The urban poor are disproportionately exposed to flooding, storms, and other hazards, generating greater risks to the low-income households typically located along canals and riverbeds. With increasing river pollution and waste leakage, the risks to these households are increased.

Building resilience through waste management

Through its resilience strategy, Can Tho aims to develop as a green, sustainable, proactive, and integrated river city where people enjoy prosperity and safety from shocks and stresses, and no one is left behind. The strategy was a result of two years of highly committed and dedicated efforts by city leaders and staff from multiple city departments, NGOs and

1 Can Tho Resilience Strategy, 100 Resilient Cities pioneered by The Rockefeller Foundation

Figure 4
Key shocks and stresses in the city

associations, experts from institutes and universities in the city, enterprises, as well as local communities. Using a resilience lens, the strategy clearly identified pressing challenges and prioritized four goals i.e. collaborative effort to develop and implement policies, promoting resilient infrastructure, encourage a diverse economy, and to ensure communities' resilience to withstand the challenges posed by the city's location in a climatically vulnerable region. The strategy also identified immediate and long-term actions that the city must take in order to meet these challenges.

Infrastructure and environment has been identified as one of the four focus areas for Can Tho, with a need to strengthen the resilience of the city through green infrastructure measures. Under this focus area, solid waste management has been identified as one of the key challenges faced by the city including increasing solid waste, rampant disposal of waste in the city's channels and canals and mismanaged waste streams. The amount of domestic solid waste generated is about 930 tons/day and expected to reach 2,000 tons/day by 2030[2]. However, the city's waste and wastewater treatment capacity are still very limited despite considerable efforts. During the past 20 years, many channels, and canals in Can Tho City have been encroached on by unauthorized construction, or blocked by waste, despite regulations restricting such practices. This encroachment and leakage of waste in the water bodies has caused pollution and has a major impact on the city's water storage and drainage capacity.

These challenges also impact the city's ability to respond to the prevalent shocks and stresses. Appropriate actions towards efficient, sustainable, and equitable waste management and reduction of waste leakage in the city's water bodies is crucial for the city to build resilience. To solve these interrelated resilience and waste challenges, Can Tho joined the Urban Ocean program in March 2020 to advance solutions in river waste management and move towards achieving the priority goals of enhancing tourism and economic activities in the city.

The Urban Ocean program aims to advance the goals aligned with the Can Tho resilience strategy through rigorous research and stakeholder engagement, define opportunity areas in the city and conceptualize pilot ideas ready to implement. The program was jointly led through the Urban Ocean partners Resilient Cities Network, Ocean Conservancy and The Circulate Initiative, and implemented by the Resilience Office of the City of Can Tho and Dragon-Mekong Institute of Can Tho University in the city. For the Urban Ocean Gap Assessment, the Circularity Assessment Protocol, a baseline assessment of waste and circularity within the city conducted as part of the Urban Ocean program, was deployed. The local team also collaborated with other relevant partners for implementation of specific project ideas.

To maximize resilience co-benefits and to positively

The Urban Ocean program was implemented in Can Tho as below:

2016–17

Resilience strategy

Can Tho identifies waste management as a key challenge

2020

Launch of Urban Ocean (Launch of program and Preparation forum)

Can Tho joins the Urban Ocean program to address interrelated resilience

2020–21

Gap Assessment (Circularity Assessment Protocol -CAP, City Waste Management Profile, Opportunity Assessment Tool - OAT)

The city undertakes assessment of risks and vulnerabilities within the waste management systems that lead to plastic leaking into the municipal environment and beyond; identification of opportunities by rethinking waste

2021-22

Design Proposal

Project Statements and Accelerator summit

The city develops specific actions to advance solutions to address plastic waste challenges

2 Report on Environmental Protection in Can Tho City, 2020

impact the wider social, economic and environmental context, waste management must be tackled in an integrated manner. An integrative approach will include objectives of reducing waste, managing the existing waste efficiently to reduce waste leakage in water bodies, promoting sustainable innovations as well as impacting livelihoods. Actions towards improving waste management and recycling can provide resilient and sustainable solutions that reduce waste pollution and address key stresses in the city, such as improving public health, supporting employment and economic development, and reducing environmental degradation.

The Can Tho Urban Ocean initiative is changing the relationship between the city and the waste it produces. It envisions strengthening the recycling industry from a resilience and circularity perspective and incorporates activities to add value to materials, reduce the amount of waste being produced, decrease health and environmental risks associated with inadequate waste disposal, with economic and social co-benefits of enlarging the recycling industry.

4. Legal, Policy and Governance

Governance structure

Vietnam is structured into 4 hierarchical levels of governments (central, provincial, district, and commune), but the important interface is between the central government at the national level and provinces or centrally administered cities, also known as sub-national governments. The sub-national government of Can Tho includes the city government and nine districts. Below the districts, there are urban wards and rural communes. The following authorities are involved in and impact the waste management systems in Can Tho. Their roles and responsibilities are as follows:

National Level	The Prime Minister issued Directive No. 41/CT-TTg in 2020, regarding urgent measures to strengthen the management of solid waste, to the following ministries: • **Ministry of Natural Resources and Environment** – develop and issue norms/guidelines related to waste management and pricing services. • **Ministry of Construction** – develop technical standards and regulations on the design of the solid waste collection systems and transit points. • **Ministry of Health** – direct local authorities to focus on the disposal of hazardous medical waste. • **Ministry of Finance** – prioritize the balance and allocation of environmental protection expenditures to support waste management activities in the annual budget plan
Provincial Level/ City Level	At the provincial or city level, the **Department of Natural Resources and Environment** (DONRE) has been assigned full responsibility for municipal waste management by the Can Tho City People's Committee. The People's Committees of provinces have the following tasks: • Take responsibility for the classification, collection, transportation, and treatment of waste in their area; allocate sufficient annual funds to support the waste management • Ensure compliance to local regulations on solid waste management • Formulate and promote incentive policies to attract investment in waste treatment projects • Direct and organize the work of sorting waste at source in accordance with local conditions • Specify fees that households and individuals must pay for the collection, transportation and treatment of domestic solid waste • Review and evaluate existing waste treatment technologies in the area Along with DONRE, the Department of Construction in the city oversees the planning and construction of waste management infrastructure, including transfer stations and waste treatment plants.
District Level	**DONRE** directly advises and assists the People's Committee of the district to perform this task and is responsible for the quality of sanitation in the area.
Ward/ Commune Level	**Urban officials and Cadastral** officials are assigned by the People's Committees of wards/communes to concurrently take on the task of managing the environment and solid waste in the local area.

National and local regulations and guidelines

The National Assembly of Vietnam passed the Law on Environmental Protection (LEP) in 2020. This includes additional regulations on the reduction, reuse, recycling, and treatment of plastic waste, limits the use of single-use plastic products and non-biodegradable plastic bags, and encourages the production of environmentally friendly alternatives to replace traditional plastic products.

In January 2022, the revised LEP 2020 came into effect in Vietnam. The law highlights the responsibilities of ministries and local governments to integrate circular economy principles in planning strategies, development plans, waste management, and waste recycling. More specifically, it requires localities to ensure: (1) that 100% of waste is separated at source according to the types specified; (2) the development of a plan to collect and treat solid waste according to volume.

In addition, conscious of growing marine pollution, Vietnam has also launched a national action plan for the management of marine plastic litter, aiming to reduce Vietnam's marine plastic debris by 75% by 2030. By then, the country will seek to have eliminated single-use plastics and non-biodegradable plastic bags from all coastal tourism areas.

In parallel, the Ministry of Natural Resources and Environment has actively coordinated with local authorities and socio-political organizations to organize public awareness campaigns on plastic waste.

Existing projects for waste management

The existing projects executed by the city for waste management are focused on augmentation of treatment facilities in the city.

1. O Mon solid waste treatment facility (continued expansion of treatment facility)

→ Current processing capacity: about 1,500 tons/day

2. Solid waste treatment facility in Thoi Lai district, Can Tho

→ Processing capacity: By 2030 about 1,000 tons/day

3. Solid waste treatment facility in Vinh Thanh district, Can Tho

→ Processing capacity: By 2030 about 1,000 tons/day

Key city strategies and plans for waste management

Cities must play a major role for the national government to achieve its targets, and Can Tho is committed to moving forward with increased efforts in improving and facilitating waste management and recycling. The Can Tho Solid Waste Management Plan released by the city of Can Tho in 2015 outlined goals related to the expansion of infrastructure related to solid waste management for the coming decades, summarized as follows:

By 2020:

- → Continue implementing phase 2 of the solid waste disposal complex in O Mon district (expanding by about 27 ha) and phase 2 of the solid waste disposal complex in Thoi Lai district to further develop about 10 ha, meeting the needs of domestic and industrial solid waste treatment. Invest in phase 1 of the solid waste treatment area in Vinh Thanh district (about 15 ha).
- → Implement a roadmap to close the scattered conventional and hazardous solid waste treatment sites that are no longer suitable for Can Tho city.

2021–2030:

- → Continue to improve management capacity and community awareness.
- → Invest in equipment for solid waste collection, transportation, and treatment.
- → Perform synchronous solid waste classification at source and solid waste collection and transportation in the city area.
- → Build and complete solid waste treatment zones in Thoi Lai and Vinh Thanh districts.

After 2030, towards 2050:

- → Expand solid waste disposal complexes to meet the city's treatment needs in future. Upgrade solid waste treatment technologies which are land-saving, energy-saving and environmentally friendly according to sustainability criteria.

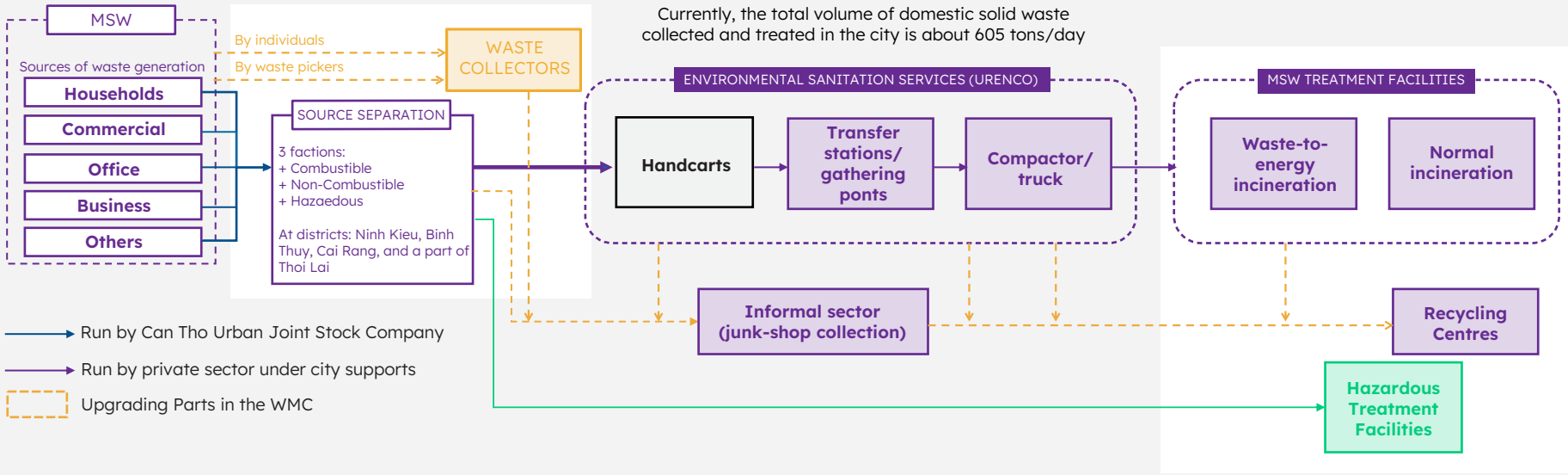
The new national legal framework can establish a broader classification of waste, increase the demand for new solutions and create an enabling environment for the recycling industry to grow in the city. To guide this growth and guarantee that it will yield multiple benefits, including sustainable economic development, the municipality is looking for integrated solutions that reduce waste leakage into rivers and enhance the collection and treatment of river waste. Strong commitment, improved capacity of involved stakeholders and public awareness will be key to achieving the goals set out by the framework.

5. Waste Management in the City

Overview of Can Tho's waste management system

According to the Report on Environmental Protection in Can Tho City, 2020, for the period of 2015–2020, the average amount of solid waste generation in the city fluctuated from 919 to 974 tons/day. This was an increase of 10–15% over the previous period (2010–2015: 818 tons/day). The amount being collected and treated was about 65% of the total waste generated. The city's waste management services are operated by public-private and private companies which are involved in collection services, including Joint Venture Do Duy Construction Company Limited, Production Service Trading Joint Stock Company 69, and Minh Thong Trading Service Co., Ltd. Informal players such as waste pickers, junk shops and collection facilities are also involved in the city's waste management system. The reuse and recycling of domestic solid waste is only carried out on a small scale. The collected waste is transported to the Waste to Energy treatment plants in the city. The following figure summarizes the city's existing waste management value chain:

Figure 5
Can Tho's waste flow chart



Waste generation and characterization

Growing urbanization, economic development, and improved living standards and lifestyles have caused a sharp growth in municipal solid waste (MSW), especially in Can Tho's urban districts. The waste generation of the city is 930 tons/day (0.76 tons per person per day), out of which around 605 tons of waste is collected and treated. (Report on Environmental Protection in Can Tho City, 2020). The key sources of waste in Can Tho are as follows:

- → Households
- → Industries – substandard products from industrial production
- → Agricultural activities – leftover produce, livestock sites generating solid waste, and waste generated in the process of harvesting, making agricultural products
- → Hospitals/medical centers – medical and hazardous waste from hospitals (100% collected)

Waste characterization

Most of the domestic waste in Can Tho is organic, biodegradable food waste. Plastics account for a relatively small proportion (8%) of the entire household solid waste stream in Can Tho city.

Currently the city council classifies waste only as "burnable", "non-burnable waste" or "hazardous waste" to facilitate the work of the incineration plant, overlooking possibilities for recycling and composting The city needs to include other categories such as plastics, paper, organic waste to enable waste separation at source and allow for recycling businesses to be created.

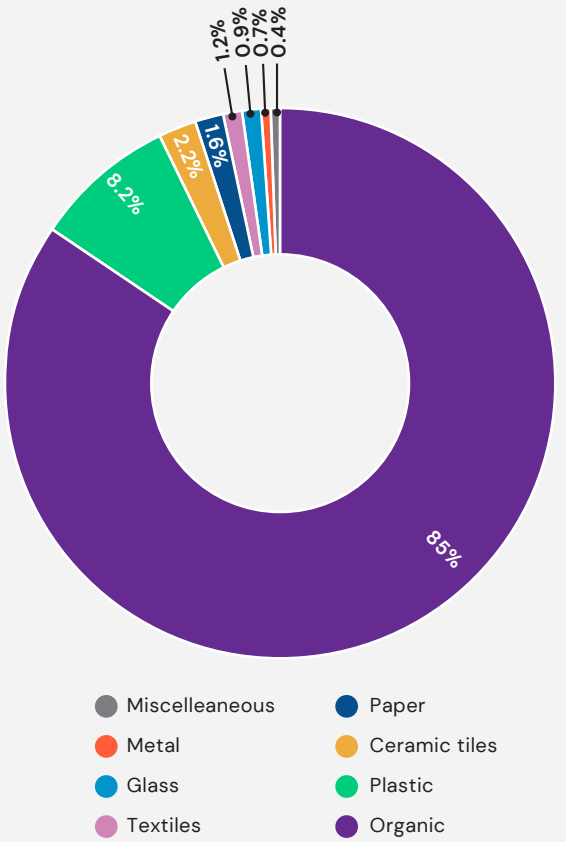
Waste collection and transportation

Out of the total waste generated, 65% is collected and transported to treatment facilities in the city. The city envisions that by 2030, 100% of MSW will be collected and treated, and 90% of waste will be recycled, reused, and recovered to produce energy or organic fertilizer to ensure environmental safety. Qualitative research indicates that it is difficult to access waste collection services in rural areas or the more remote residential areas.

System: The city implemented a public bidding for collection and transportation services of domestic waste in the districts over a three-year period. The waste is collected and sent to the transfer stations, from where it is taken to the treatment facilities.

In terms of marine debris, the city council is carrying out pilot projects to test waste collection devices in the river. These waste collection devices are restricted to only a few locations because the initiative does not have a scale-up plan that can ensure financial sustainability of the devices.

Figure 6
Waste characterization in Can Tho



Agencies/stakeholders: Various public-private and private companies participate in collection services, including Joint Venture Do Duy Construction Company Limited, Production Service Trading Joint Stock Company 69, and Minh Thong Trading Service Co. Ltd.

Cost of services: Service prices for waste collection and transportation are specified by Can Tho city in regulation No. 40/2016 /QD-UBND dated December 2016 of the City People's Committee. Currently, the service price for a household is between USD 0.85-1.25/ month. The waste collection agencies are responsible for collecting the fee, which serves as their income. However, they struggle to collect the fee because many households are unwilling to pay it. The rate of fees payment in the central area (Ninh Kieu) is 90%, whereas in other districts the rate is less than 50%. The situation is exacerbated by the local government's lack of punishment for non-payment[3].

Service provision to low-income households: Domestic waste collection coverage in rural areas/ peri-urban areas is lower compared to urban areas. There are a few neighborhoods which lack waste collection services due to poor accessibility by vehicles, inadequate equipment and limited awareness within the community. Most of the waste collection in these areas is conducted by voluntary cooperative organizations or small and medium enterprises.

Treatment and disposal

Existing treatment facilities/landfills

The city's solid waste is collected and transported to a waste-to-energy (WtE) plant located in Thoi Lai District or the treatment zones in O Mon District, Co Do District, Thot Not District, and Vinh Thanh district. Currently, most of the MSW in the city is treated by the WtE plant, which was awarded to Everbright International Co. Ltd (China) following a bidding process in a build-operate-own model. It is important to note that WtE plants have negative consequences because of associated GHG emissions and no reuse and recovery of plastics for recycling. Urban Ocean partners recognize the need for implementable and circular solutions in Can Tho that hold plastics producers accountable for the full lifecycle of their products, cease the leakage of plastics into the environment, and incentivize reuse.

Recycling of waste

Currently, the reuse and recycling of domestic solid waste is carried out on a small scale (household scale) and in a limited manner. The recycling of domestic waste is also available at the city's waste treatment plant in limited capacity. A survey of the quality and percentage of domestic waste recycling or reuse has not been conducted.

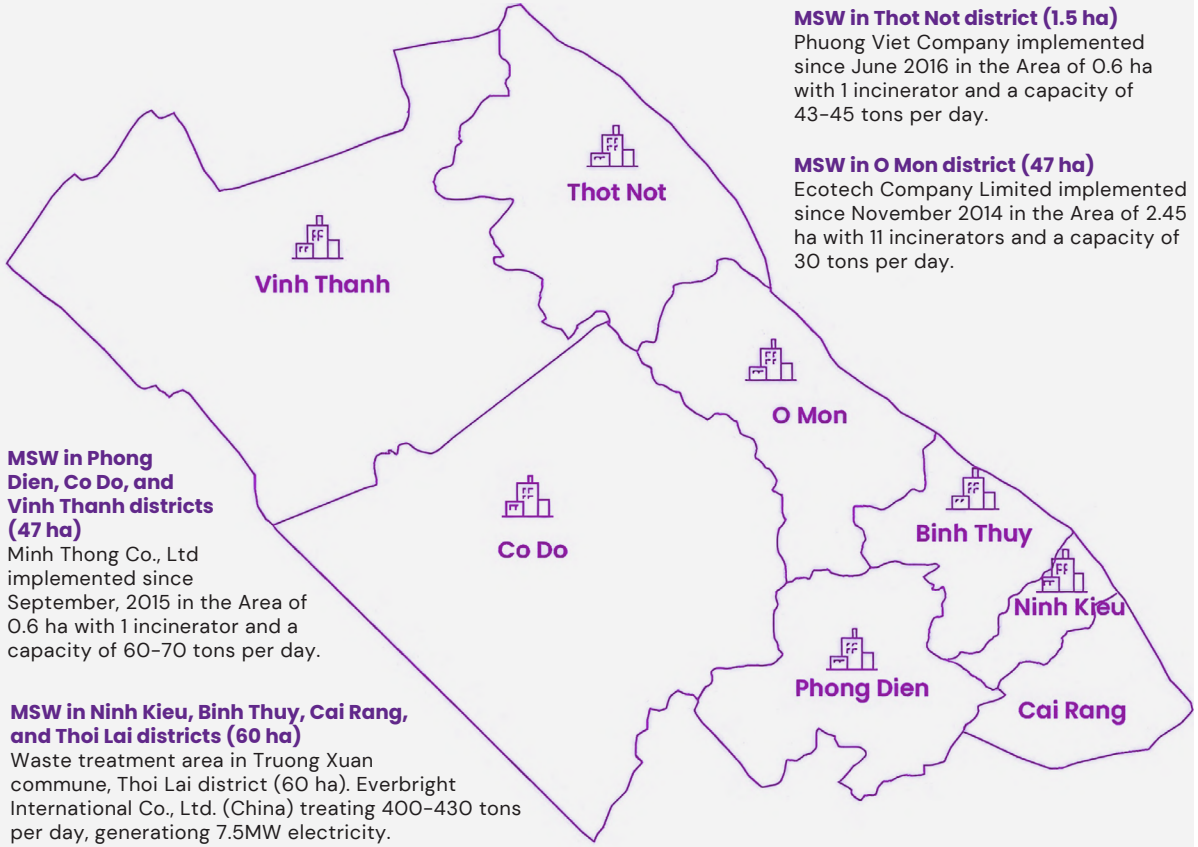
The reuse and recycling of industrial solid waste is common and is undertaken by industrial facilities themselves. The collected reusable wastes are reused as inputs for other production processes or sold to other companies/sectors for reuse. The city lacks private sector investment and involvement in waste management and recycling infrastructure.

Informal sector in recycling

The recycling sector in Can Tho is completely informal and is considered an important component of waste collection and management in the city in its contribution to reducing waste leakage in the city's water bodies, landfills and the built environment. Informal waste workers often remove recyclables from the waste streams such as waste on the streets or in the public garbage bins and sell them to the recycling centers/aggregators located outside the city. These activities are not regulated by the authorities. Scraps traded in the informal sector are scrap metal, plastic, glass, paper and other recyclable materials which are of value to the waste pickers.

3 Can Tho SME Resilience Profile, Improving Waste Management in Can Tho, 2023 - https://resilientcitiesnetwork.org/wp-content/uploads/2023/06/Can_Tho_SME_Profile.pdf

Figure 7
Existing treatment facilities in the city



MSW in Thot Not district (1.5 ha)
Phuong Viet Company implemented since June 2016 in the Area of 0.6 ha with 1 incinerator and a capacity of 43-45 tons per day.

MSW in O Mon district (47 ha)
Ecotech Company Limited implemented since November 2014 in the Area of 2.45 ha with 11 incinerators and a capacity of 30 tons per day.

MSW in Phong Dien, Co Do, and Vinh Thanh districts (47 ha)
Minh Thong Co., Ltd implemented since September, 2015 in the Area of 0.6 ha with 1 incinerator and a capacity of 60-70 tons per day.

MSW in Ninh Kieu, Binh Thuy, Cai Rang, and Thoi Lai districts (60 ha)
Waste treatment area in Truong Xuan commune, Thoi Lai district (60 ha). Everbright International Co., Ltd. (China) treating 400-430 tons per day, generationg 7.5MW electricity.

Source: Report No.2156/STNMT-CCBVMT on solid waste management in Can Tho city in 2019

6. Key Findings and Opportunities

	Key challenges	Potential opportunities
Urbanization and governance	• Can Tho is an important route for facilitating commercial activities and transporting goods through its canals. With modernization and industrialization, urban growth, and climate change, these activities have led to a substantial increase in solid waste leakage into the water bodies as well as built environment in the city. • The city has identified a governance gap in the city's river waste management issue as there is no entity that has a clear mandate to manage solid waste in rivers.	• Can Tho is committed to increase efforts in improving and facilitating waste management and reducing waste leakage into the rivers. The city has set ambitious goals and has a vision for the coming decades, within the national strategy for solid waste management and infrastructure. The city can explore how to attract more private participation in collecting and sorting the waste from rivers.
Resilience	• During the past 20 years, many canals have been encroached by unauthorized construction, or blocked by waste, despite regulations restricting such practices. This encroachment and leakage of waste in the water bodies has caused pollution and has a major impact on the city's flooding, water storage and drainage capacity. • The urban poor are disproportionately exposed to flooding, storms, and other natural hazards, generating greater risks to low-income households along canals and riverbeds, particularly in terms of safety and health.	• River waste management will lead to a decrease in pollution and provide an opportunity to strengthen the tourism potential of the city, boosting economic activities of local communities.

Existing waste management systems

- Relatively low amounts of plastic exist in the municipal solid waste stream in the city.
- The city's municipal waste is classified as "burnable", "non-burnable", and "hazardous". This too-simple classification not only limits the possibility of recycling or reusing waste sources, but also does not align with the LEP.
- Waste collection services do not cater to the entire city leading to illegal dumping. The recycling sector in Can Tho is limited, informal and largely unregulated.
- The city agrees that the current waste collection infrastructure is inadequate – mainly the collection vehicles and transfer stations and collection efficiency need to be improved, which is also reflected in the city's solid waste management plan.
- In the context of the LEP, there is an opportunity to broaden waste classification to include other categories such as plastics, paper, organics, etc. so it can increase waste separation at source and evaluate value chains so that recycling businesses can be created.
- The collection and transportation system can be improved by working on operational efficiency. The city can also explore how this infrastructure could be better suited to the local urban fabric, particularly in the inner city, where alleys are narrower, thereby improving collection efficiency in the city.

7. Glossary of Terms

CAP: Circularity Assessment Protocol. Assessment protocol developed by the University of Georgia to identify and analyze waste streams, particularly plastics.

DONRE: Department of Natural Resources and Environment

GHG: Greenhouse Gases

IPCC: Intergovernmental Panel for Climate Change

LEP: Law on Environmental Protection 2020

MSW: Municipal Solid Waste. Waste that originates in homes and establishments such as commercial establishments, educational institutions etc.

OAT: Opportunity Assessment Tool

OC: Ocean Conservancy

R-Cities: Resilient Cities Network

TCI: The Circulate Initiative

USD: United States Dollar

WRI: World Resources Institute

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