

Case study \_\_\_\_\_

# Cagayan de Oro, Philippines Asia

# Cagayan de Oro

## Philippines

**Population**

778,642 (2021 est.)

**Size of the city**

570 km square

**Settlement type**

urban, coastal

**Year of Survey**

2021

**Total MSW Generation**

138.7 kg/cap/year

**MSW Collected**

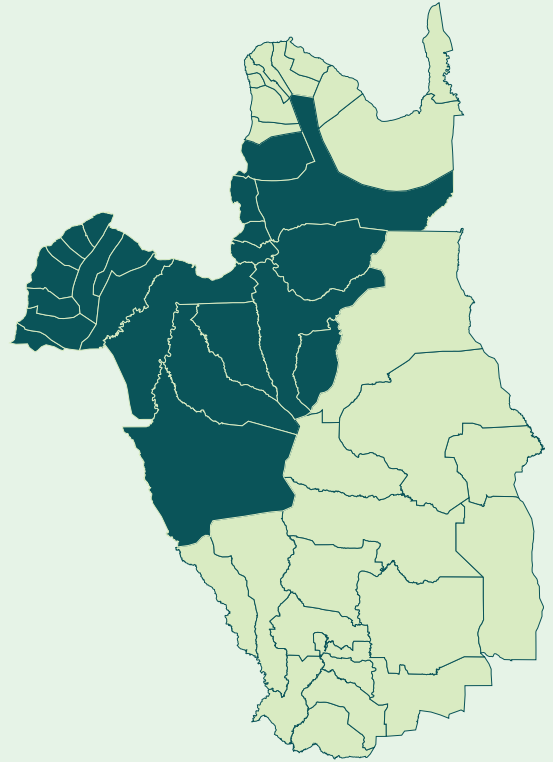
92%

**Plastic Waste Generation**

19.5 kg/cap/year

**Plastic to water systems**

0.3 kg/cap/year



### Context and description

Cagayan de Oro is a highly urbanised city in the region of Northern Mindanao and the 10<sup>th</sup> most populous city in the Philippines. It is the capital of the province of Misamis Oriental where it is geographically located.

According to the 2015 census, the population of Metro Cagayan de Oro is estimated to be 1.37 million. Located along the north central coast of Mindanao island facing Macajalar Bay, the city is covering an area of 413 km<sup>2</sup> and has a tropical monsoon climate, with a wet and dry season. The survey was conducted during the dry season.

The motivation for undertaking the WFD was to understand and visualise the plastic leakage at different MSWM stages, in order to come up with solutions to further improve the performance of the MSWM system. This case study was implemented under leadership of the UN Habitat HOCCI programme.

This case study's data was collected by UN Habitat

## Survey Implementation Arrangement

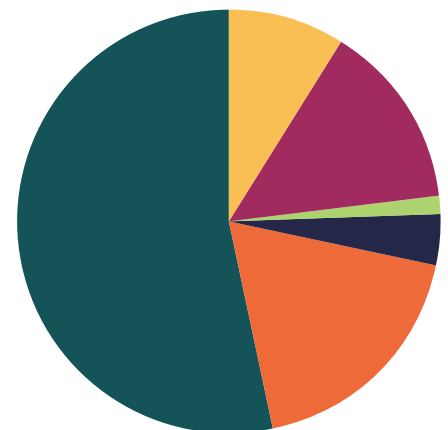
<b>City</b>	Cagayan de Oro
<b>Financed by</b>	UN Habitat - Healthy Oceans and Clean Cities Initiative (HOCCI)
<b>Implemented by</b>	Cagayan de Oro municipality with backstopping support from International consultants

## Overview data

<b>Population</b>	778,642 (2021 est.)
<b>Waste generation rate, including commercial and institutional waste</b>	0.38 kg/cap/day (WaCT Survey)
<b>Total MSW generation</b>	297 tonnes/day (WaCT Survey)
<b>Collection rate</b>	92% (WaCT Survey)
<b>MSW sent to disposal</b>	260 tonnes/day / 87% (WaCT Survey)
<b>MSW sorted for recovery</b>	16 tonnes/day / 5% (WaCT Survey)
<b>MSW managed in controlled facilities</b>	91% (WaCT Survey)
<b>Plastic waste generation</b>	15,203 tonnes/year
<b>Unmanaged plastic</b>	1,426 tonnes/year 9% of the entire plastic waste generation

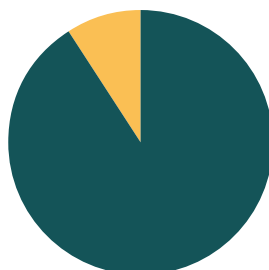
## MSW composition at point of generation

<span style="display: inline-block; width: 15px; height: 15px; background-color: #f9c74f; border: 1px solid black; margin-right: 5px;"></span> paper 9.00%	<span style="display: inline-block; width: 15px; height: 15px; background-color: #1a3d4d; border: 1px solid black; margin-right: 5px;"></span> metals 4.00%
<span style="display: inline-block; width: 15px; height: 15px; background-color: #993366; border: 1px solid black; margin-right: 5px;"></span> plastics 14.00%	<span style="display: inline-block; width: 15px; height: 15px; background-color: #e67e22; border: 1px solid black; margin-right: 5px;"></span> other 18.00%
<span style="display: inline-block; width: 15px; height: 15px; background-color: #90d990; border: 1px solid black; margin-right: 5px;"></span> glass 2.00%	<span style="display: inline-block; width: 15px; height: 15px; background-color: #1a3d4d; border: 1px solid black; margin-right: 5px;"></span> organic 53.00%



## WFD results

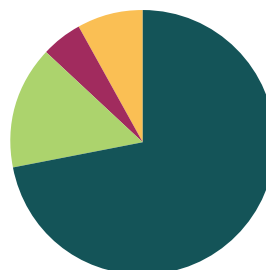
Plastic waste generation: 15,203 t/y



unmanaged  
9%

managed  
91%

Unmanaged plastic



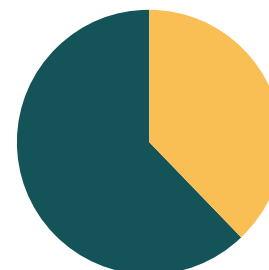
in water systems  
15%

cleaned from drains  
5%

openly burnt  
8%

retained on land  
72%

Plastic to water systems



entering via storm drains  
38%

directly entering water systems  
62%

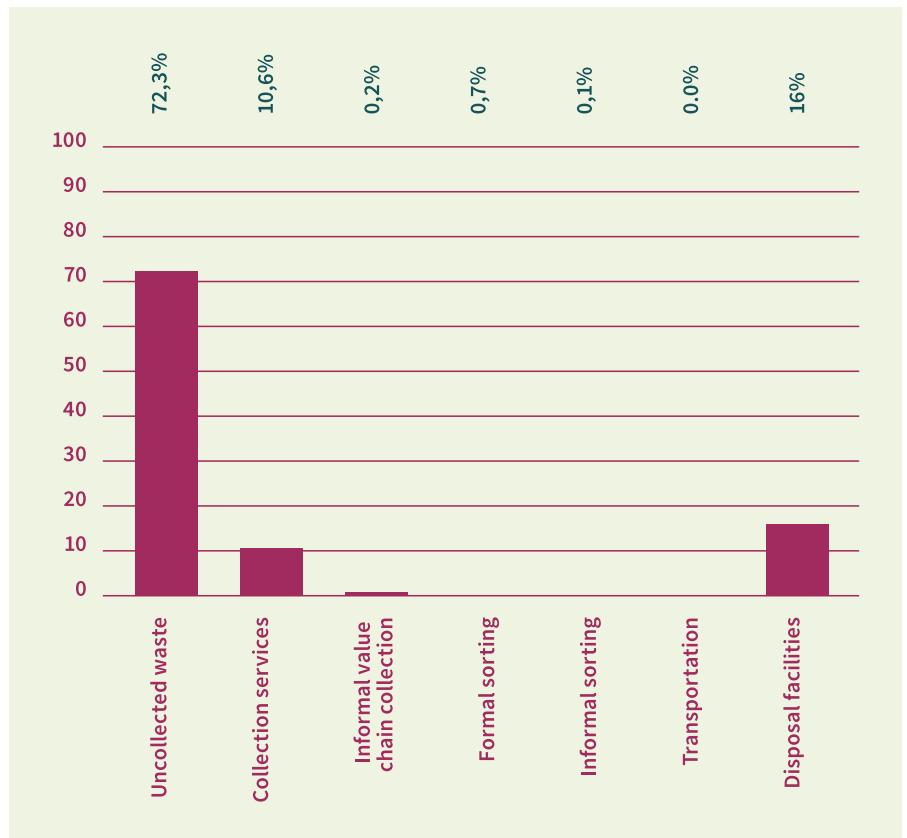
## WFD Results in Cagayan de Oro

Plastic waste to the environment	1,426 tonnes/year	9% of the plastic waste generated
Plastic to water systems	214 tonnes/year	315 trucks
Plastic to water systems per person	0.3 kg/person/year	9 PET bottles per person

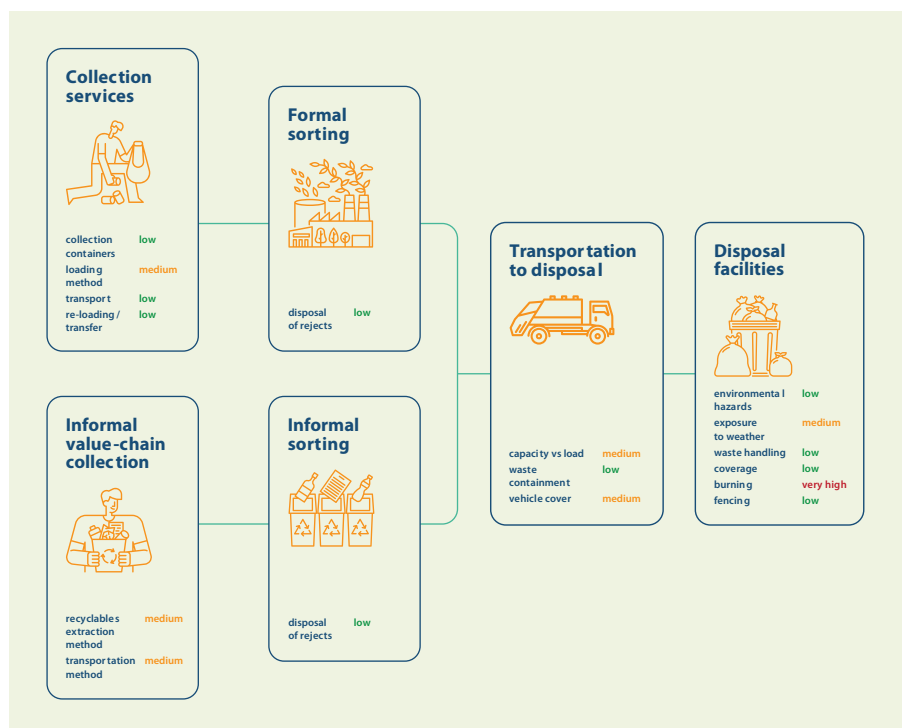
## Contribution to unmanaged plastic by SWM stage



## Contribution to unmanaged plastic by SWM stage



## Plastic leakage potential levels per leakage influencers



## **Lessons Learned & Challenges**

- The data published is collected in line with the WaCT concepts and definitions, which might not be aligned by similar concepts and requirements by laws and regulations in the Philippines when related to SWM;
- The WFD assessment was carried out during the Covid-19 pandemic, in tandem with a WaCT assessment. Therefore, it was not possible for a consulting team to visit the city due to travel and cross-infection restrictions, however, the city committed to undertaking the full assignment on their own with remote guidance and backstopping support;
- The city team was fantastic in their ability to mobilise the survey teams for the assessment and conducted a very thorough assessment;
- The main lesson learnt was that a city/municipal team can do a WFD assessment, so long as they have backstopping support for understanding the methodology, approach and toolkit, and quality assuring the final output.

## **Use of WFD / Triggered Change**

- The WFD (and WaCT) assessment fed into a wider project managed by UN-Habitat, 'Health Oceans and Clean Cities Initiative', the focus of which was on reducing marine plastic pollution;
- The WFD assessment provided an authoritative baseline upon which to design follow-up 'Action Planning' initiatives, with the City decision makers taking a lead role in formulating and adopting pollution prevention measures.