

Case study _____

Huế, Viet Nam

Asia

Huế

Vietnam

Population

488,157 (2020)

Size of the city

266 km square

Settlement type

urban

Year of Survey

2021

Total MSW Generation

303 kg/cap/year

MSW Collected

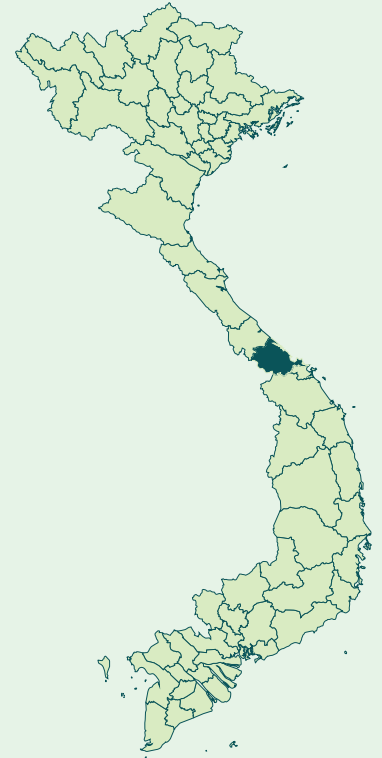
97%

Plastic Waste Generation

46.8 kg/cap/year

Plastic to water systems

1 kg/cap/year



Context and description

Huế city is located in central Viet Nam with the Perfume River running through it and leading to the East Sea.

The population was estimated to be 488,157 people in 2020, prior to the 2021 administrative boundary extension with the Extended city area now encompassing 266km². The WFD was carried out for both the Core and Extended areas which included collecting samples from 9 wards and communes including 6 in the Core area and 3 in the Extended area of the city.

The extension of the city resulted in an urgent need to assess its MSWM system and reduce plastic waste. This included undertaking the WFD in order to build a database and implement the project “Huế city – A Plastic Smart City in Central Viet Nam” which aims to improve their MSWM system.

This case study's data was collected by WWF

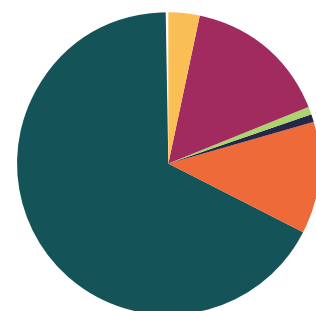
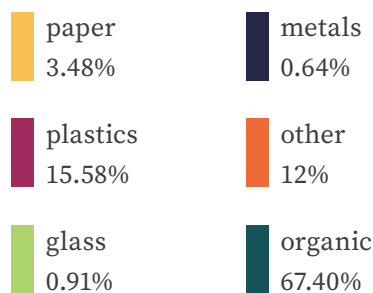
Survey Implementation Arrangement

City	Huế
Financed by	WWF - TV Action-Plastic Smart Cities
Implemented by	National consultants with backstopping support from International consultants

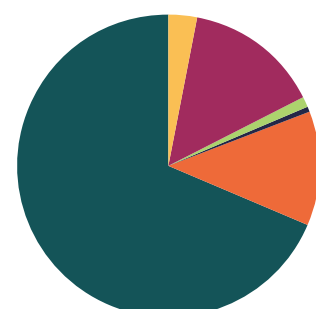
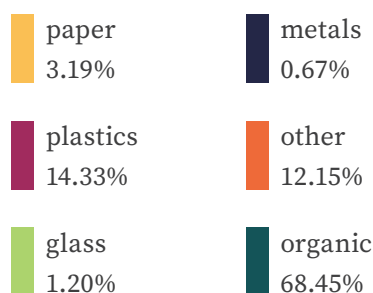
Overview data

Population	488,157 (2020)
Waste generation rate, including commercial and institutional waste	0.83 kg/cap/day (WaCT Survey)
Total MSW generation	408 tonnes/day (WaCT Survey)
Collection rate	97% (WaCT Survey)
MSW sent to disposal	313 tonnes/day / 77% (WaCT Survey)
MSW sorted for recovery	83 tonnes/day / 8% (WaCT Survey)
MSW managed in controlled facilities	77% (WaCT Survey)
Plastic waste generation Core / Extended Area	19,337 tonnes/year 3,516 tonnes/year
Unmanaged plastic waste Core Area	349 tonnes/year 1.8% of the entire plastic waste generation
Unmanaged plastic waste Extended Area	366 tonnes/year 10.4% of the entire plastic waste generation

MSW composition at point of generation Core Area



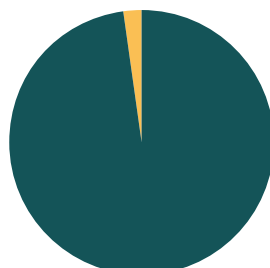
MSW composition at point of generation Extended Area



WFD results

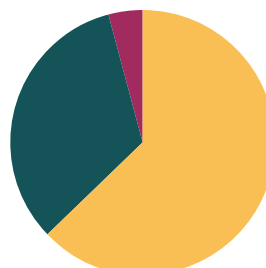
Core Area

Plastic waste generation: 19,337 t/y



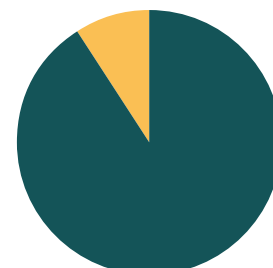
unmanaged 2%
managed 98%

Fate of unmanaged plastic waste



retained on land 33%
cleaned from drains 4%
ending up in water systems 63%

Plastic to water systems



contribution directly entering water systems 93%
contribution entering via storm drains 7%

WFD Results

Core Area

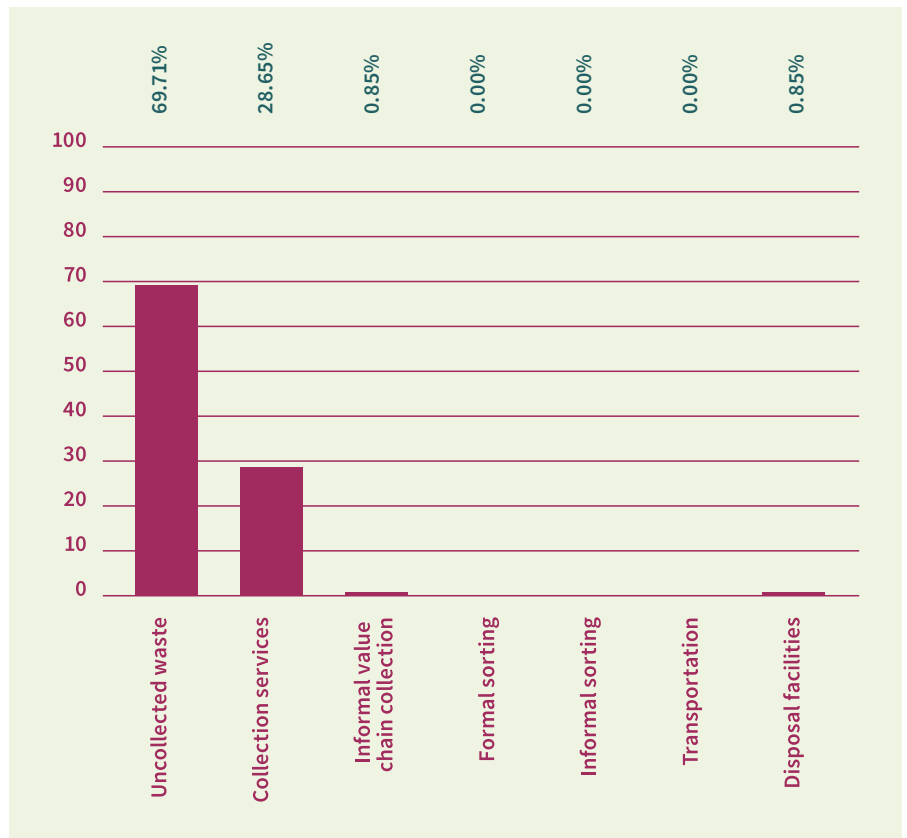
Plastic waste to the environment	350 tonnes/year	2% of the plastic waste generated
Plastic to water systems	219 tonnes/year	322 trucks
Plastic to water systems per person	0.6 kg/person/year	21 PET bottles per person

Contribution to Unmanaged Plastic Waste by SWM Stage

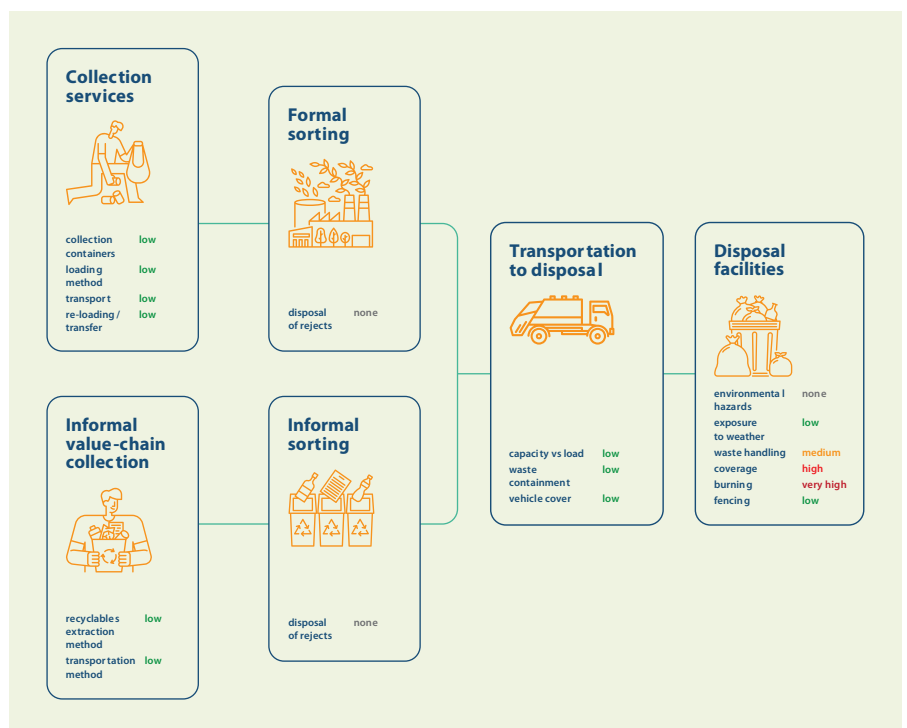
Core Area



Contribution to Unmanaged Plastic Waste by SWM Stage Core Area

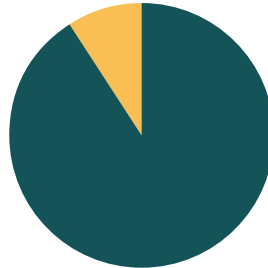


Plastic Leakage Potential Levels per Leakage Influencers in the Core Area



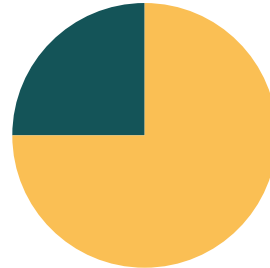
WFD results Extended Area

Plastic waste generation: 3,516 t/y



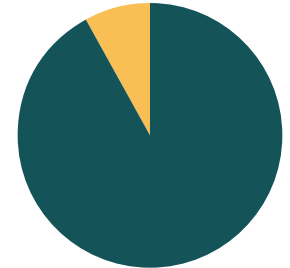
unmanaged 10%
managed 90%

Fate of unmanaged plastic waste



retained on land 25%
cleaned from drains 0%
ending up in water systems 75%

Plastic to water systems



contribution directly entering water systems 92%
contribution entering via storm drains 8%

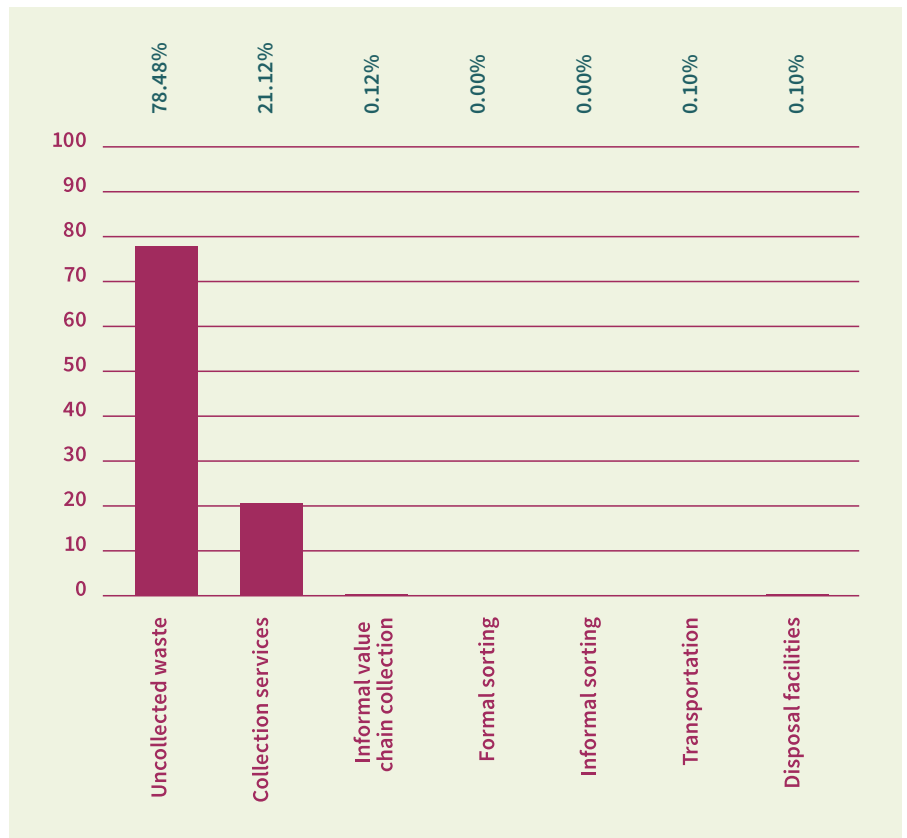
WFD Results Extended Area

Plastic waste to the environment	366 tonnes/year	10% of the plastic waste generated
Plastic to water systems	273 tonnes/year	402 trucks
Plastic to water systems per person	2.0 kg/person/year	68 PET bottles per person

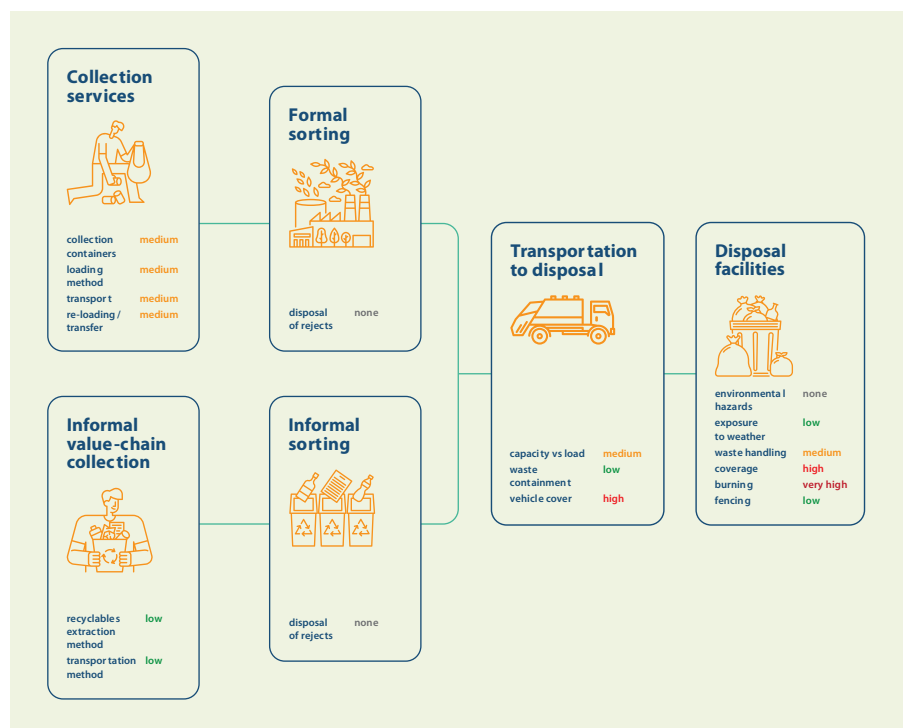
Contribution to Unmanaged Plastic Waste by SWM Stage Extended Area



Contribution to Unmanaged Plastic Waste by SWM Stage Extended Area



Plastic Leakage Potential Levels per Leakage Influencers in the Extended Area



Lessons Learned & Challenges

- Initially, the timescale of the assessment was longer than estimated, which was mainly due to COVID and a lack of data. Therefore, the assessment was performed by taking into consideration two approaches: Hué City Core Area and Hué City Extended Areas. Additionally, SWM data for the extended area was not always readily available;
- It was difficult to arrange interviews with and survey informal recovery facilities and waste pickers. This was due to the complicated trading relationship between recovery facilities;
- There was some concern that the WFD might structurally overestimate leakages to water, this was when compared to a plastic waste hotspots study;
- The WFD differentiates between informal service chain, informal value chain, formal sorting, informal sorting, collection rate, collection service coverage rate etc. All of these categories require careful attention when inputting data.

Use of WFD / Triggered Change

- Informal collection and recovery are currently not considered under collection efficiency, resulting in some complications when showing and highlighting materials extracted from landfill, whilst not losing these from collected waste;
- The Sankey diagram does not allow for differentiation between materials recovered from landfill either by waste pickers or formal recovery systems. Instead, it was redesigned to show diversion from landfill by informal recovery.