

Case study _____

Haridwar, India Asia

Haridwar

India

Population
251,197

Size of the city
12.3 km²

Settlement type
Urban

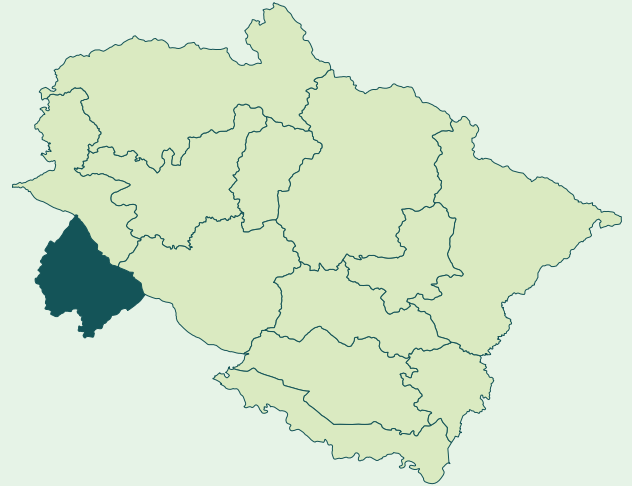
Year of Survey
2020-2021

Total MSW Generation
335.1 kg/cap/year

MSW Collected
99%

Plastic Waste Generation
26.2 kg/cap/year

Plastic to water systems
328 kg/cap/year



Context and description

Haridwar is a city and municipal corporation in the Haridwar district of Uttarakhand. The city, which is situated on the western bank of the river Ganges, has a significant national cultural importance and serves as a gateway to several places of worship.

One of the most significant events is the Kumbh Mela, during which millions of pilgrims, devotees, and tourists congregate in Haridwar to perform ritualistic bathing on the banks of the river Ganges.

Haridwar Municipal Corporation, Haridwar Nagar Nigam (HNN), consists of 60 wards with a total population of 251,197 in 2018, which makes Haridwar the second largest city in the state of Uttarakhand and the largest in the district.

The assessment of Haridwar was conducted from November to December 2020 during the ongoing COVID-19 pandemic in India. In order to prevent infection risks for the personnel of this assessment and due to existing restrictions, this study had to be conducted with certain limitations and adjustments of the methodology. Due to the COVID-19 pandemic, deviations from the previous disposal behaviour were observed, with a tendency to an increased share of sanitisation and hygiene products, packaging waste as well as delivery and to-go food and beverage containers.

This case study's data was collected by GIZ







Survey Implementation Arrangement

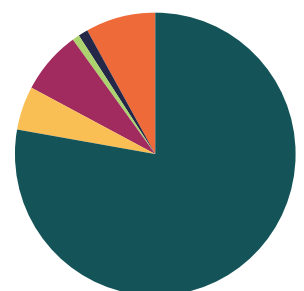
City	Haridwar
Financed by	GIZ
Implemented by	GIZ

Overview data

Population	251,197
Waste generation rate, including commercial and institutional waste	0.91 kg/cap/day
Total MSW generation	228.6 tonnes/day
Collection rate	99%
MSW sent to disposal	216.11 t/day
MSW sorted for recovery	9.6 t/day
MSW managed in controlled facilities	0%
Plastic waste generation (high collection coverage)	5,099 t/year
Unmanaged plastic (high collection coverage)	1,069 t/year

MSW composition at point of generation

 paper	5%	 metals	1%
 plastics	7%	 other	8%
 glass	1%	 organic	78%

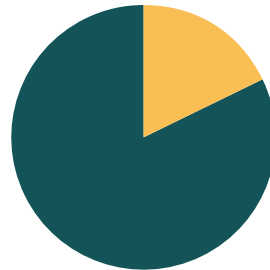


WFD results Haridwar

Plastic waste generation: 5,840 t/y

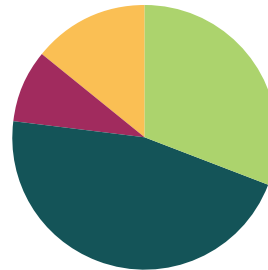
Fate of unmanaged plastic waste

Plastic to water systems



unmanaged
18%

managed
82%

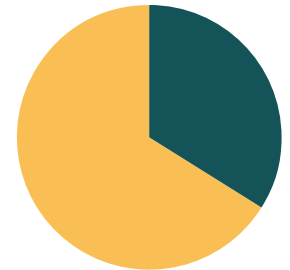


in water systems
31%

cleaned from drains
9%

openly burnt
14%

retained on land
46%



contribution directly entering water systems
66%

contribution entering via storm drains
34%

Plastic waste to the environment

1,069 tonnes/year

18% of the plastic waste generated

Plastic to water systems

328 tonnes/year

482 trucks

Plastic to water systems per person

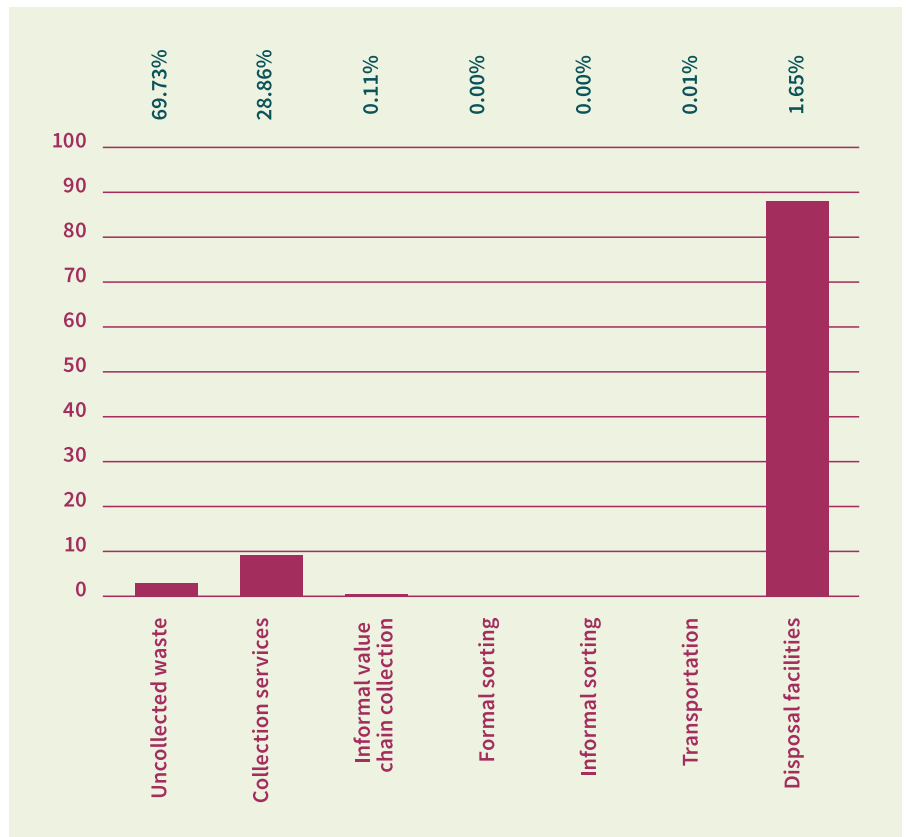
1.31 kg/person/year

44 PET bottles per person

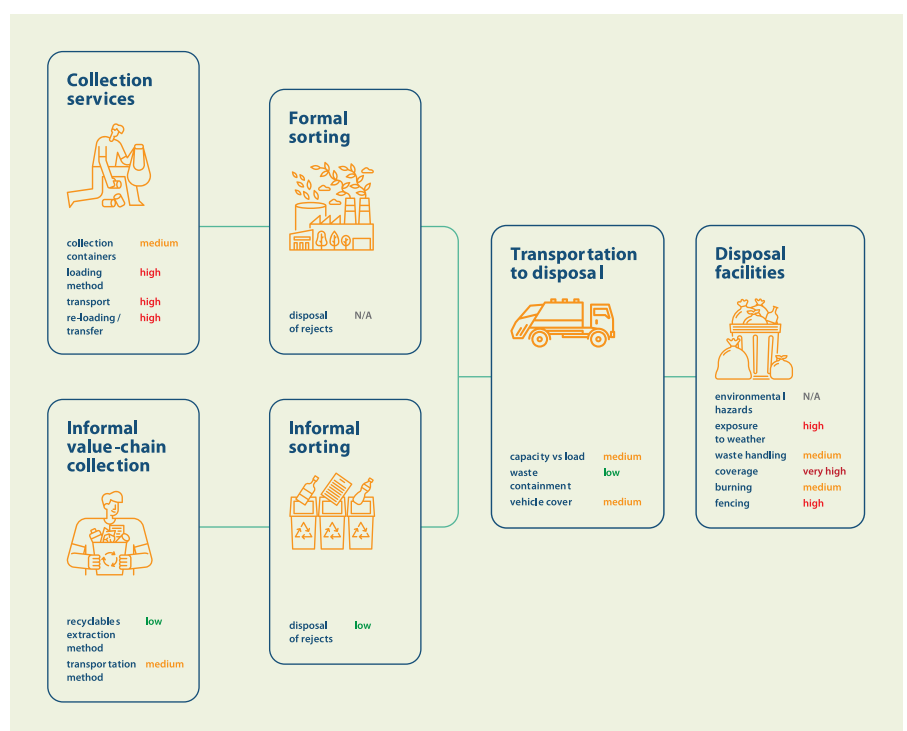
WFD Results in Haridwar



Contribution to unmanaged plastic waste by SWM stage



Plastic leakage potential levels per leakage influencers in Haridwar



Lessons Learned & Challenges

- Overall, volumes and capacities of primary waste collection vehicles and bins were found to be generally sufficient for the city's requirements. However, waste leakage at community bin locations, at transfer points between primary and secondary collection, as well as open littering are major challenges within the MSWM system;
- In order to increase waste recovery, waste segregation, separate collection and transportation streams need to be introduced.

Use of WFD / Triggered Change

- Ground quantification of waste leakage in Haridwar requires significant resources and financial efforts, the application of the WFD provides an easy and low-cost way to estimate waste leakage and track progress of infrastructure interventions.