



Indicator 11.6.1

Waste Collection and Treatment

Operationalizing indicator

Eawag: Swiss Federal Institute of Aquatic Science and Technology
 Sandec: Sanitation, Water and Solid Waste for Development

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Introduction

Indicator 11.6.1

- In the EGM, Geneva, 2018:



UN-Habitat



Eawag, Wasteaware, UN-Habitat



“Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated, by cities”

JICA



UN-Habitat



Introduction

Indicator 11.6.1

$$x = \frac{\text{Municipal solid waste collected}}{\text{Total municipal solid waste generated by the city}} \times 100 (\%)$$

$$y = \frac{\text{Municipal solid waste managed in a controlled facilities}}{\text{Total municipal solid waste generated by the city}} \times 100 (\%)$$

Operationalizing “Collected”

- Municipal waste collection is a service provided to households, economic units or institutions (generators) to remove the waste generated. This waste is then referred as “collected”.
- The remaining share of MSW is considered “uncollected”.
- Waste collection is independent of the legal status of the service provider (formal or informal).
- Waste collection is a service independent of what happens to the waste after collection (i.e. final disposal, treatment, recycled, illegal dumping, etc.)

Operationalizing “Collected”

Generation



Collection point



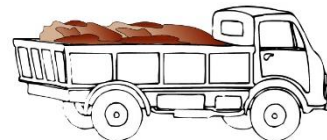
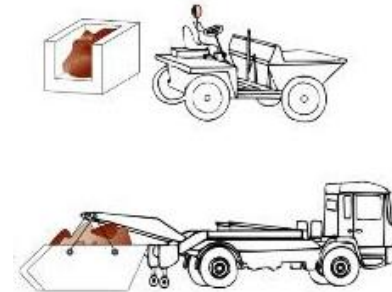
Primary
collection



Transfer
station



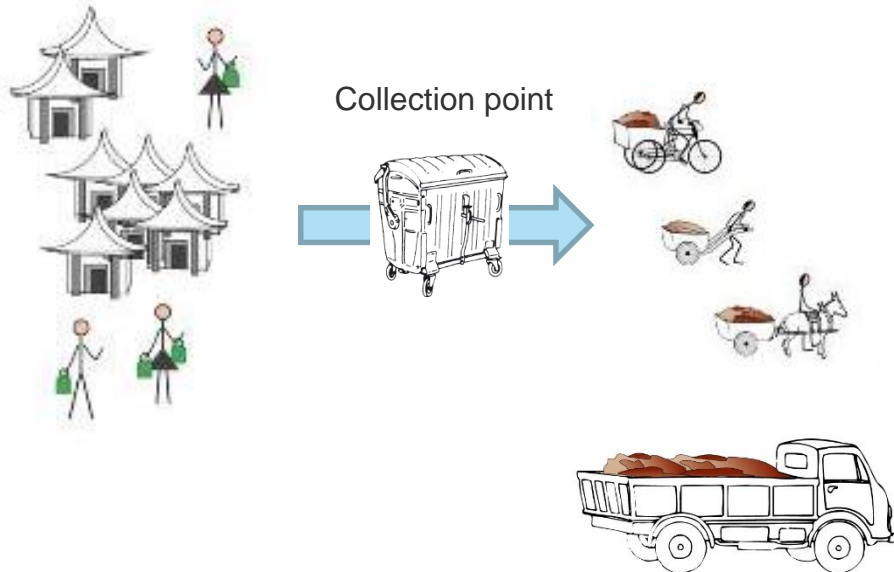
Secondary
collection



Operationalizing “Collected”

Generation

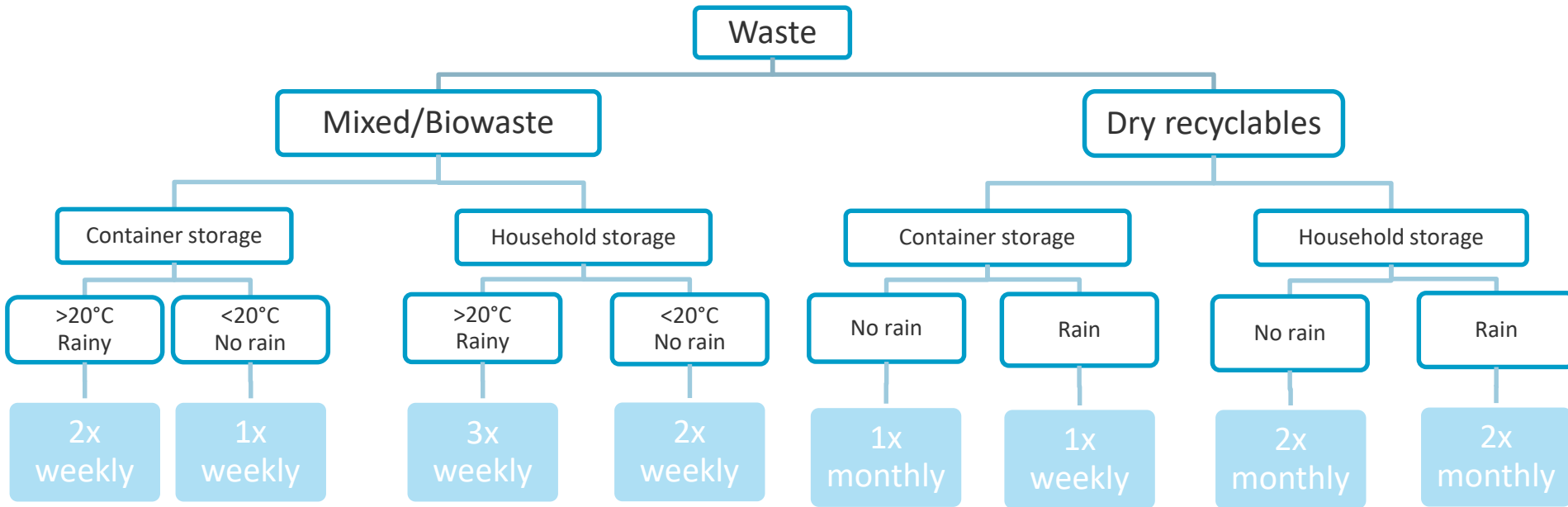
Primary
collection



- **Location**
- **Frequency**
- **Regular**
- **Efficiency**

Frequency

“Minimum requirement” for collection



Regularity

Regular collection hints at a certain stability and reliability in the frequency of collection

| Minimum Frequency | Maximum duration of the interruption of service |
|--------------------|---|
| 3 x weekly | 1 week |
| 2 x weekly | 2 week |
| 1 x weekly | 4 weeks |
| 2 x monthly | 1 month |

...Difficult to measure...

Collection efficiency

- Appropriate frequency and regularityBUT.....not sufficient to collect the full amount of waste generated.

$$x = \frac{\text{Municipal solid waste collected by service}}{\text{Total municipal solid waste generated in serviced area}} \times 100 (\%)$$

Location of Collection point

- When waste is delivered to a storage facility (e.g. container, collection point, etc.) maximum distance should not exceed 200 m.

| MSW Collection SERVICE LEVEL | DEFINITION |
|------------------------------|---|
| State of the art | <ul style="list-style-type: none"> Fulfills the criteria of Improved service (see below) SMART data management systems linked to monitoring and control Collection efficiency is >95% |
| Improved | <ul style="list-style-type: none"> Fulfills the criteria of basic service (see below) Compliant to set sanitation standards for health protection for workers Compliant to prevent waste spillage from collection vehicles. Effective monitoring and control Collection efficiency is >75%* |
| Basic | <ul style="list-style-type: none"> Formal or informal collection service In the form of either door-to-door collection or collection point within 200m distance With adequate frequency[#] and regular[#] time gaps (twice a week?). Collection efficiency is >50%* |
| Limited | <ul style="list-style-type: none"> Formal or informal collection service Sporadically without any schedule, thus with limited frequency or regularity, or where the collection point is farther than 200m distance (Note: If one of the above criteria is not fulfilled then the service is “limited”) |
| No | <ul style="list-style-type: none"> No collection service. No organized service. Waste is managed by the waste generators themselves. |

Data collection

Different levels of accuracy

1st and most important: have reliable information on **waste generation**

- High accuracy:
 - Random surveys to households (low, middle, high income), economic units and institutions (frequency, regularity, efficiency, distance)
 - Estimate street sweeping
- Medium accuracy:
 - Info on no. of trucks/trips to disposal, recycling, treatment and estimate loads + estimates of informal amounts (surveys)
- Low accuracy:
 - Info on no. of trucks/trips (formal & informal) and estimate load
 - Underestimation: recycling & treatment not considered, informal sector...

Thank you for your attention

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