Advances in quantifying plastic marine litter to support waste management decision making in local authorities of the Global South

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A GLOBAL CHALLENGE

Microplastics found in craft beers made with Lake Superior water. University of Minnesota study.
The problem... in numbers

- About 300 M tonnes of plastic waste is generated annually.
- 9% is recycled -12% incinerated and the rest disposed in dumpsites/landfill sites.
- 8-10 M tonnes of plastics escape into the ocean every year.
- 5 trillion items of microplastics getting into the sea every minute.

- 60 - 90% of marine litter is plastic (UNEP-GRID 2016).
- 80% of marine litter from on land-based sources.

- 2.5 BILLION metric tons of solid waste is produced all around the world.
- 275M metric tons of coastal plastic waste.
- 100M metric tons of coastal plastic waste.
- 8 MILLION metric tons of plastic goes into the ocean.
- 2 BILLION PEOPLE WITHIN 30 MILES OF THE COAST CREATE.
THE TOP 10 CORPORATE PLASTIC POLLUTERS IN GLOBAL BRAND AUDITS

- **PEPSICO**: 5,720
- **Mondelez International**: 1,664
- **Nestle**: 2,950
- **Coca-Cola**: 9,216
- **Danone**: 1,843
- **Unilever**: 1,230
- **Mars**: 1,085
- **Perfetti Van Melle**: 676
- **Consort Foods**: 615

Source: https://www.breakfreefromplastic.org/2018/10/11/branded-pollution/ #breakfreefromplastic
1. Insufficient infrastructure

2. Markets for secondary materials

3. Knowledge gaps

What is wrong?

Global systemic failures

2 billion people without access to solid waste collection
Most of the plastic escapes from the Global South

- Low collection coverage
- Irregular collection services
- Illegal open dumping
- Open burning
- Informal activities
- Contaminated plastic scrap from countries of the Global North
- Low-tech recycling units
- Fewer trained people
- Lack of political stability & environmental law enforcement
- Disarticulated economies

An estimated 3.2m tonnes of plastic polluted Indonesian waters in 2010
What do we need?

- Master plans on municipal, regional and national level to prevent and tackle marine litter
- Scientific proven tools
Methodology

The tool has been developed using Microsoft Excel taking into account:
- Sources
- Factors that affect the location and quantity of potential plastic leakage
- Transfer coefficients to model transfer of plastic from source to final receptors
- Global scientific experience
Combined with CVORR

The tool has the capability to expand to quantification of loss of “value” present in waste plastics via combination with the Complex Value Optimization and Resource Recovery (CVORR) approach (Iacovidou et al., 2017)

This approach assesses how value is created and destroyed in resource recovery from waste systems. It achieves this by taking into account environmental, economic, social and technical positive and negative impacts within the socio-political context of the specific regions.
Data-Required
It estimates...
Results you get…
Customised solutions…
POLICY/ENGINEERING

Take no action

Provide all households with waste collection services

Increase collection frequency

Engage with residents to tackle littering and dumping

Enclose storm drains

INTERVENTIONS WITHIN THE TOOL

- Take no action: 23
- Provide all households with waste collection services: 136
- Increase collection frequency: 114
- Engage with residents to tackle littering and dumping: 95
- Enclose storm drains: 77

Tonne/year
CREATE SCENARIO

IDENTIFY INTERVENTIONS

PRIORITISE INTERVENTIONS

RUN THE TOOL

REVIEW RESULT

THE CONTINUOUS IMPROVEMENT CYCLE
Validate
Run case studies to expand database

Partnership
Come alongside us!
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