

Newsletter #12

October 2021 - MSWM & Marine Litter



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Intro: What does municipal solid waste management (MSWM) have to do with marine litter?

Marine litter poses a serious threat to the oceans, wildlife and human health. More than 800 species of marine life suffer from adverse effect such as blockage of digestion and entanglement¹. Marine litter can also have serious consequences on economic activities such as fishing and tourism. In the Asia-Pacific Economic Cooperation region alone, marine litter is estimated to cause losses to the tourism sector of about USD 622 million per year², whereas the fishing sector in the European Union reports losses of USD 81.7 million per year of net income. Considering financial losses to fisheries, tourism and time spent on clean-up activities, the global cost of environmental damage to marine ecosystems accounts for USD 13 billion³.

A significant amount of marine litter originates from sea-based sources⁴; mostly through direct dumping and abandoned, lost or discarded fishing gear. However, the majority of marine litter originates on land and includes waste either littered or inadequately managed finding its way to the ocean by wind, tidal transport, or inland waterways. Plastic waste -accounting for 60-80% of all marine litter- is a matter of specific concern, also due to its durability and inability to biodegrade¹. Each year around 8 million tons of plastic enter the ocean, mostly across middle- and low-income countries⁵, mainly due to a lack of effective municipal solid waste management systems. As such, high-income countries

-although having higher waste generation rates per capita- most likely contribute less to marine litter. This means that the improvement of waste management systems across all steps (generation, collection, treatment and disposal) plays a pivotal role in decreasing and avoiding marine litter generation.



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Evidence from cities

In order to improve waste management systems across all steps and avoid the leakage of waste into the environment, ending up as marine litter, reliable and up-to-date data is needed to inform the planning process. For this reason, the [Global Partnership on Marine Litter \(GPML\)](#) supported the application of the Waste Wise Cities Tool (WaCT) and the [Waste Flow Diagram \(WFD\)](#) in 5 cities in 2021: Dar es Salaam (Tanzania), Karachi (Pakistan), Khulna (Bangladesh), Lagos (Nigeria) and Santo Domingo (Dominican Republic), with some interesting results.

In Dar es Salaam, it was found out that about 6,000 tonnes of MSW is generated every day of which 36% is collected and only 1% is managed in controlled facilities, resulting in 3.3 kg/person/year of plastics

leaking into water bodies. In Karachi, about 12,000 tonnes of MSW is generated daily of which 80% is collected and 0% managed in controlled facilities, leading to 3.4 kg/person/year of plastic leakage to water bodies. In Lagos, approximately 12,000 tonnes of MSW is generated daily of which 48% is collected and managed in controlled facilities resulting in a city plastic leakage to water bodies of 17.9 kg/person/year. The reason why the amount of plastic leaking from Lagos' waste management system is so much higher than in the other cities is due to a higher plastic consumption in low income areas, where many households engage in small businesses but do not have access to waste collection services. On the other hand, in Khulna, waste collection rate is relatively low at 63%, but the plastic

leakage was only about 1.1 kg/person/year, mainly due to the lower plastic consumption by households.



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1 German Environment Agency, 2016. Available online at: https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/final_policy_brief_plastics_recycling.pdf

2 Mcllgorm, A.; Campbell, H.F.; Rule, M.J. The economic cost and control of marine debris damage in the Asia-Pacific region. *Ocean Coast. Manag.* 2011, 54, 643–651.

3 Watkins, E.; Brink, P.; Withana, S.; Mutafoğlu, K.; Schweitzer, J.-P.; Russi, D.; Kettunen, M. *Marine litter: Socio-Economic Study: Scoping Report*; Institute for European Environmental Policy: London, UK; Brussels, Belgium, 2015; Available online: https://wedocs.unep.org/bitstream/handle/20.500.11822/26014/Marinelitter_socioeco_study.pdf?sequence

4 UNEP 2005, Allsop et al 2006, Eunomia 2016

5 Jambeck, J.R., Geyer, R., Wilcox, C., Siegler, T.R., Perryman, M., Andrady, A., Narayan, R. and Law, K.L., 2015. Plastic waste inputs from land into the ocean. *Science*, 347(6223), pp.768-771.

Global Partnership on Marine Litter



(c) UNEP

Through this collaboration, the GPML supported UN-Habitat in the development of the Waste Wise Cities Tool (WaCT) and its application in several cities around the world in 2021 (see above). This provides key data for SDGs 14, 11 and 12 which informs UNEP's National Source Inventories of marine

litter and plastic pollution and supports the development of National Action Plans. National Source Inventories aim to identify and quantify the main sources, pathways, and hotspots of marine litter and plastic pollution emissions from countries, and

the WaCT is well suited to collect this data at city level, helping cities to identify policy interventions and infrastructure investment gaps by facilitating evidence-based decision making. UNEP is also developing the GPML Digital Platform, a one-stop-shop online data hub aiming to bring together all stakeholders working on marine litter and plastic pollution. The platform provides a unique opportunity to share knowledge and experience, where partners are able to work together to create and advance solutions to this pressing global issue. You can access the GPML Digital Platform [here](#).

The Global Partnership on Marine Litter (GPML) was founded at the Rio+20 summit in 2012 with the mission to protect the global marine environment by addressing the global problem of marine litter and plastic pollution. It is a multi-stakeholder partnership that brings together over 400 organisations working to prevent marine litter and plastic pollution. GPML is led by a Steering Committee and the United Nations Environment Programme (UNEP) provides its secretariat services. You can read more [here](#).

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Global Partnership on Marine Litter

Get to know our Affiliates

In this section we give our Waste Wise Cities Affiliates the possibility to introduce themselves.

Environment and Food Foundation (E2F)



"Cameroon's economic capital Douala, with a population of about 4 million inhabitants has recently been experiencing an upsurge of plastics waste pollution. This is mostly due to increased production from the breweries and water bottling companies, combined with increasing population and poor waste management systems.

In 2017, the coastal city of Douala produced more than 20,000 tons of plastics waste daily of which about 5% was collected and less than 1% recycled.

Environment and Food Foundation (E2F) is a nongovernmental organization (NGO) based in Douala, Cameroon working on the collection and valorization of plastics waste (plastic bottles, wrappings, nylons, plastic bags). Our innovative approach seeks to strengthen the plastics supply and value chains, create new jobs, as well as relieve Douala from plastics pollution through:

- Organizing cleanup events on a regular basis in beaches, landfills, mangroves, streams, rivers, communities, dumpsites.
- Incentivizing the collection of plastics

wastes from informal waste pickers.

- Recycling plastics waste into paving tiles (eco-bricks) and other products.
- Reusing plastic waste bottles to construct eco-benches, eco-chairs, eco-tables, and bulb coverings.
- Increasing awareness and sensitization in schools and communities among students and community members on the importance of proper plastics waste management and recycling.

Our goal is setting up modern waste management and recycling factories in Douala and other cities in Cameroon highly polluted with plastics waste in order to provide a cleaner and healthier environment."

Alternative Energy Systems Ltd



“Alternative Energy Systems Limited (AESL) is a Kenyan-owned and -operated company which has pioneered the use of pyrolysis on soft plastic waste sourced from municipal solid waste streams. The output is high quality synthetic oil with a competitive calorific content against diesel and furnace oil. Soft plastic waste includes food wrappers, carrier bags, and other thin-film PP, PE, LDPE, and HDPE.

The benefits of AESL's proprietary advancements to plastic-to-energy technology are many. First, using municipal waste as a source of soft plastics diverts a sizeable fraction of waste from landfills. Second, AESL can tap into accumulated plastic waste deposits, further reducing pressure on overloaded landfills. Third, soft plastic waste is not commonly recycled, thus creating a market value for an otherwise unmarketable fraction of plastic waste. Fourth, AESL's process captures this soft plastic waste and prevents it from leaking into the environment.

AESL's product has been independently verified by globally recognised Intertek Laboratories and found to have a calorific content similar to that of diesel and better than that of furnace oil, while boasting near-zero SO₂ and NO₂ emissions. With furnace oil being a leading source of atmospheric SO₂ emissions, this can have wide-reaching implications on air quality and human health.

To find out more, please contact info@alternativeenergy.co.ke

Waste Wise Cities Affiliates



Do you want to:

- Support Waste Wise Cities and improve waste management in cities around the world?
- Be an official partner of Waste Wise Cities and UN-Habitat?
- Show up on the Waste Wise Cities website?
- Implement the Waste Wise Cities Tool?
- Read about your activities in this newsletter?
- Do much more?

Then [contact us](#) and become a Waste Wise Cities Affiliate! Together we can become Waste Wise!

Waste Wise Cities Tool (WaCT)

You have forgotten what the Waste Wise Cities Tool is? No worries, you can find all information on our [website](#). [Here](#) you find out which cities have already submitted data collected with the WaCT and as you can see from the articles below, more data will become available.

Updates – Updates – Updates!

Evaluating the control level of waste management facilities is an essential part of the WaCT. After applying the WaCT in a variety of cities around the world, the ladders of control and decision-making trees for evaluating the same needed to be updated to capture the various situations on the ground. Therefore, the ladders of control (Table 2-4) and decision-making trees (Annex 7) were updated after consultation with experts

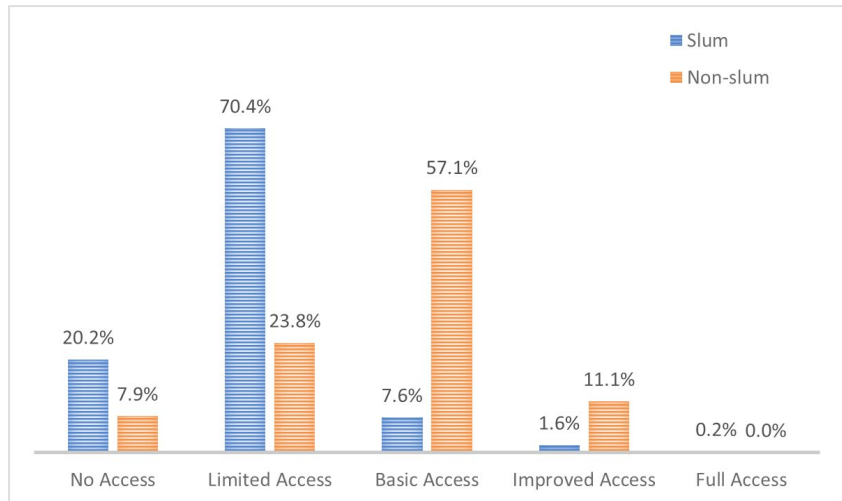
from Wasteaware engaged in the WaCT surveys in the Philippines and Lebanon. The updated ladders of control and decision-making trees contain more detailed sub-categories and criteria, to be able to respond to different situations.

Another update is the ladder of service level for waste collection (Table 1). This table defined the concept of 'proportion of population with access to basic solid waste collection service' and WaCT suggested that this should be monitored

under the framework of SDG 1.4.1 on access to basic services. However, current global household survey systems such as the Demographic Health Survey or UNICEF's Multiple Indicator Cluster Surveys (UNICEF MICS) do not fully cover this aspect. Therefore, UN-Habitat developed this year a household survey questionnaire module to assess the proportion of population with access to basic waste collection service for UNICEF MICS. As part of the process of the household questionnaire module

development, pilot testing of a pre-designed questionnaire was done in Nairobi, Kenya, and Kampala, Uganda. The survey results showed that there is a clear inequality in access to basic waste collection service between slum and non-slum residents, as can be seen in the diagram.

This pilot testing resulted in a slight change of the ladder of service level for waste collection (Table 1 WaCT), to include 'without major littering' in the criteria to be met for Basic, Improved and Full access to waste collection service level.



Insights collected on MSWM in Addis Ababa and Bahir Dar, Ethiopia

UN-Habitat Ethiopia County Office jointly with the city governments of Addis Ababa and Bahir Dar has successfully applied the Waste Wise Cities Tool (WaCT) in the two cities, under the Feasibility Study Waste Wise Cities: Tackling Plastic Waste in the Environment funded by the Alliances to End Plastic Waste.



The overall aim of the project is to support the cities of Addis Ababa and Bahir Dar in assessing the performance and status of solid waste management system, identify infrastructure and policy gaps, and develop city specific project proposals in coordination with potential waste stakeholders.

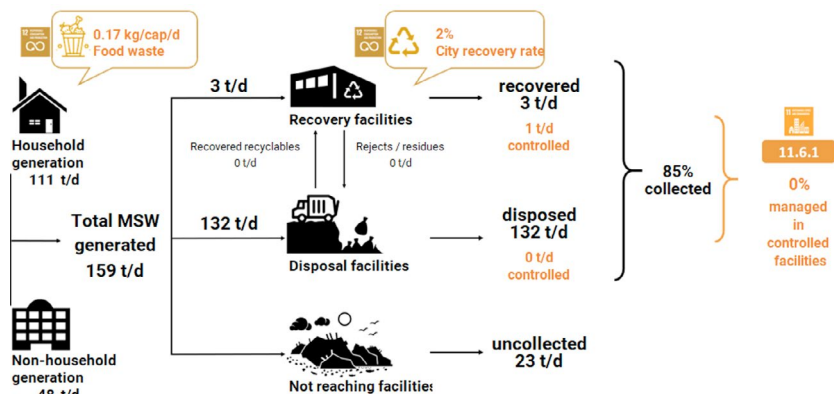
disposal facilities, waste composition at disposal facilities in both cities from mid-May to end of July and the 1st stakeholders workshops for data presentation and discussion on interventions are scheduled for the end of August 2021.

data on socio-economics, recovery facilities, business licenses etc. and lack of willingness to participate in the household waste survey as well as assessment of recovery facilities. The availability of key government partners was also challenged due to the national election happening during the survey period.

Some of the challenges encountered applying the WaCT include lack of reliable

The project team started the ground assessment in April 2021 and has finalized the application of the WaCT both in Addis Ababa and Bahir Dar cities. The major activities implemented include socioeconomic stratification using a clearly defined housing structure classes, that serve as a proxy for socioeconomic level, neighborhood selection based on income group, a full day training for volunteers, household waste sampling and waste composition analysis, MSW received by recovery facilities and control level of recovery facilities, MSW received by disposal facilities and control level of

The following chart shows the results for Bahir Dar.



The most challenging WaCT so far - Santo Domingo, Dominican Republic

The first WaCT application in a Caribbean city was realised in Santo Domingo in the Dominican Republic in June 2021. The actual implementation was done in two Waste Wise Cities member cities, East Santo Domingo and Boca Chica, where municipalities have made many efforts to improve solid waste management.



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During the survey a few challenges were encountered. For example, in Step 2 – household waste generation and composition analysis – problems with the waste collection from the households occurred, due to the limited availability of collection trucks and misuse of the provided waste liner bags by the households. Furthermore, unexpected heavy rains affected the composition survey which was conducted outside. Also, in Step 4 – amount of waste received by recovery facilities and their level of control – the identification of and interviews with recovery facilities was difficult as they were reluctant to share the relevant information with the municipality.

Nevertheless, basic information on waste generation, collection, composition and the amount received at the disposal facilities could be generated. To determine the city's recovery rate (amount managed in recovery facilities) more accurate

information needs to be gathered, which will also make it possible to identify policy and investment interventions. As the interests of the mayors is high in both cities, we hope that further analyses lead to establishment of sustainable MSWM systems.



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Collecting data on MSWM in the Democratic Republic of Congo: the example of Bukavu

Under the African Clean Cities Platform, Bukavu was selected this year for the WaCT application. Bukavu is located in the eastern Democratic Republic of Congo and has a population of 1,493,743 (2020 City Annual Report) in the urban area.

The survey was conducted in July and the result showed that approximately 900 t/d

The survey was followed by a local stakeholder workshop in August to discuss why the collection and city recovery rates are low and to identify policy and infrastructure gaps, as well as possible interventions. Concerning the collection, many actions were discussed, such as reviewing the cost of registration to encourage residents to pay for waste collection, investing in the municipality's collection equipment to strengthen the municipal solid waste collection capacity, building the capacities of youth

increasing the awareness of households, traders, and municipal council staff on sustainable solid waste management practices.

Additionally, the necessity of investment in the recycling sector was discussed to establish a stable market for recyclable materials where buying and selling at a fair price are secured. This helps youth recycling associations to transform waste into briquettes, moreover, promote local initiatives and entrepreneurs to

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