MITIGATION OF PLASTIC WASTE LEAKAGE FROM LAND TO RIVERS(OCEANS)

PLASTIC POLLUTION : INDONESIA

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So should we be concerned? What can we do?

- Top: **3-year-old** helping his parents sort waste (Jakarta Post, July 2019)
- Bottom: exemplifies **animals endangered by plastic**. A stork covered by a plastic bag at a landfill site in Spain (National Geographic, June 2018)
- **Supermarket bags** can take 1000 years to breakdown (BBC, 2018) - one of the most common marine plastic litter items (Ocean Conservancy & International Coastal Clean-up, 2018; Wagner, 2017).
- **Sustainable Development Goal 14:** Conserve and sustainably use the oceans, seas and marine resources for sustainable development (UN, 2015)

Rivers: Litter Pathway to Oceans

Photograph by Jorci Chias (National Geographic)

Two sources of ocean litter:

- **Sea**

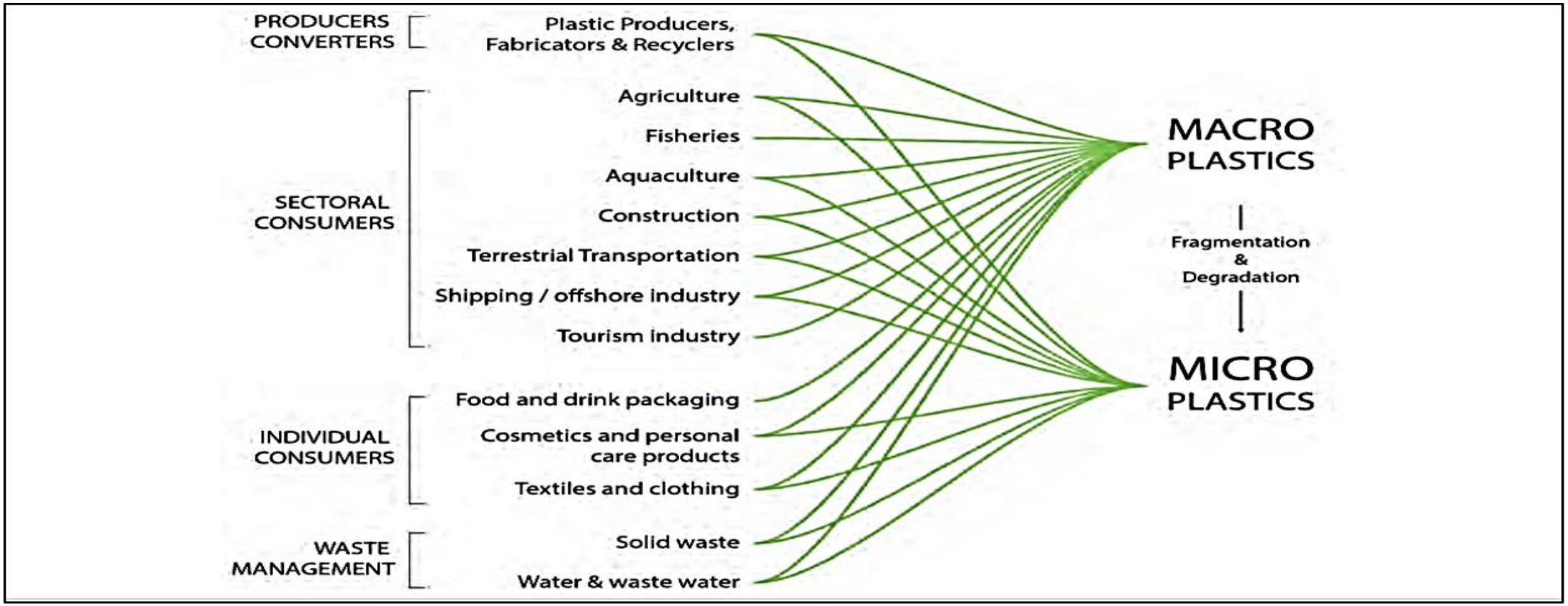
For example: lost fishing gear whether accidental or deliberate

- **Land**

Waste leakage from land → rivers → oceans

90 percent of plastic waste leakage into oceans originates from land (CIWM and WasteAid, 2018)

Plastic Waste: Potential Sources



Potential sources of microplastics entering the marine environment through rivers (GESAMP, 2016).

Plastic Waste Management: Global Environment

- 2016: **242 million tons of plastic waste globally**. Over **25% leaks into the environment through poor waste management**: open dumping, disposal in waterways and improperly managed formal disposal sites (World Bank report, 2019)
- Even when plastic waste is collected, many countries lack capacity to process the waste. In 2017, **Europe exported one-sixth of its plastic waste, mainly to Asia** (The Economist, 2018).
- Poor waste management has **negative impacts on environmental and public health**. **In addition, globally,** solid waste contributes to **climate change** and is **one of the largest sources of pollution in oceans** (World Bank report, 2019)
- **9 million tons of plastic waste enters the ocean annually** mostly via rivers. Equivalent to **five grocery bags** stuffed with plastic waste per foot of coastline (National Geographic, 2018)

Plastic Waste Management: Indonesia

Waste management structure:

- Highly decentralized, responsibility of the municipality
- Communities organize waste collectors with user fees, city organizes waste transport and disposal from local budget, private operators are typically not involved.

Source: World Bank, 2019

- **60% of Indonesian waste is collected** by municipal management systems.

Source: Race for Water, 2019

Plastic Waste Management: Indonesia

- **40% of waste burned in the open air** or **dumped into the environment**, **often directly into rivers**
- Nearly **1 million ton of Indonesian plastics end up in the ocean** every year.
- Source: Race for Water, 2019
- Image: **Citarum River** (pinterest)
- **World Wildlife Fund**: **How does plastic end up in the ocean?**

Why Focus on Plastic Litter?

- **Hundreds to thousands of years to decompose**
- **Potential harm**: flooding by clogged drains; respiratory issues due to burning; shortened animal lifespans when consumed; and contamination of water bodies (toxins from additives in manufacture) when dumped into canals and oceans or through leachate from poorly managed landfill sites
- Under ultraviolet light from the sun, plastic **degrades into 'microplastics'** and '**nanoplastics'**. **Potential harm** to humans and animals yet unknown.
- In oceans, plastic is accumulating in **swirling gyres** that are miles wide
- The Ellen MacArthur Foundation (2016) estimates that, by weight, there will be **more plastic in the oceans than fish by 2050** if nothing is done.

Why SUPs?

- SUPs = **Single Use Plastics.**
- ↑ **On-the-go** food consumption = ↑ SUPs
- Many plastic items are **immediately discarded** contributing significantly to waste generation and consequent litter (Thompson *et al.*, 2009)
- **Largest volume** of plastic waste leakage (Wildlife Countryside Link & Eunomia Research and Consulting, 2018)
- **EU definition**: for example bags, straws, drink bottles, small packaging, disposable cups and lids, wet wipes, ear buds, stirrers, sanitary towels and cigarette filters

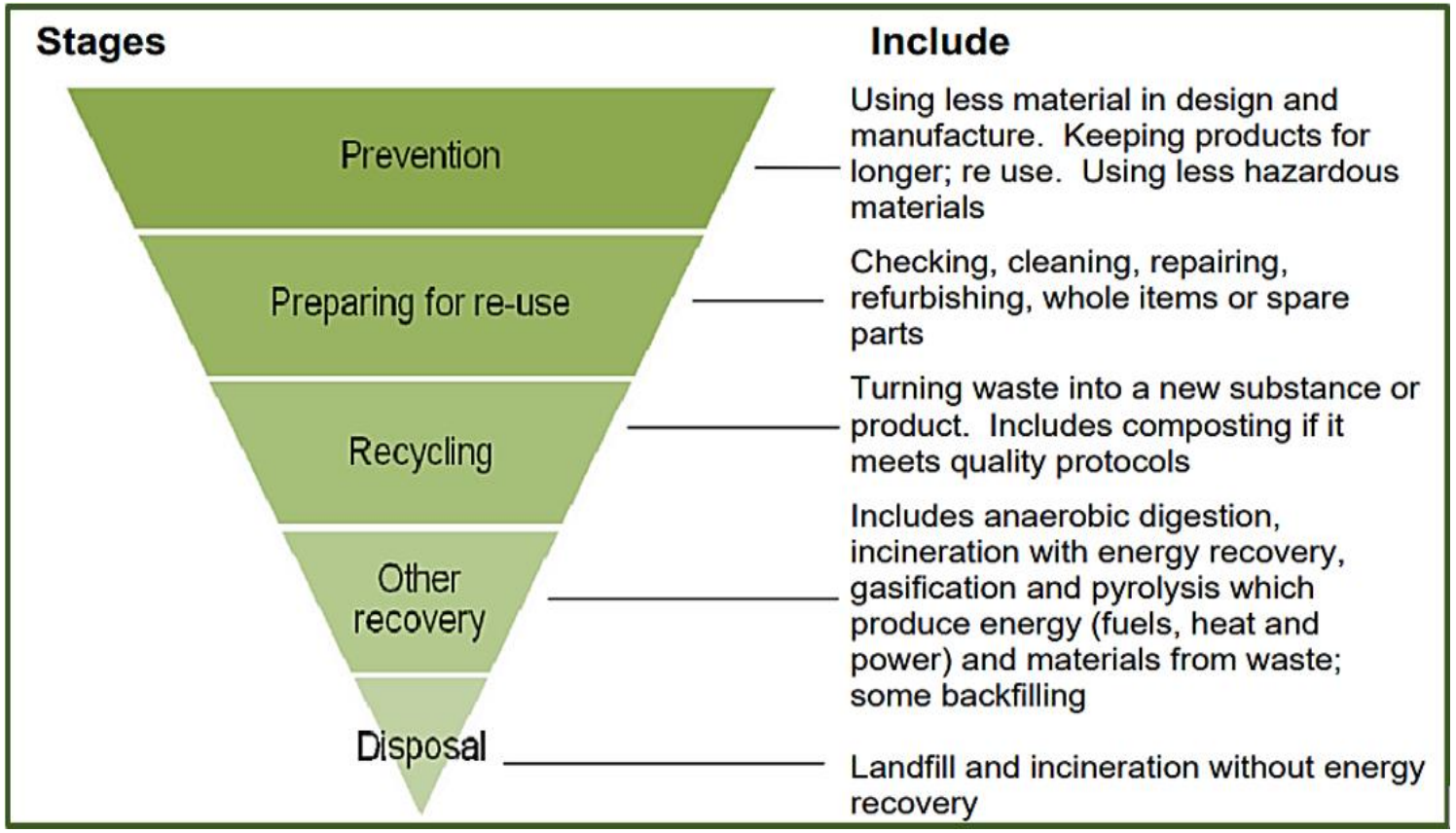
Mitigation of Plastic Leakage

Involves intervention measures along the value chain:

- Upstream (1-3)
- Downstream (4-5)

Modified from Jambeck, ET AL., "Plastic Waste Inputs from Land into the Ocean." Science 347, 2015

The 3 Rs: Reduce, Reuse and Recycle



Guidance to Waste Hierarchy. Source: (DEFRA, 2011)

Reduced consumption and production advised as the best option for the environment (World Bank, 2019)

Leakage Mitigation: Indonesia

Government Initiatives

- **Peraturan Presiden Republik Indonesia Nomor 83 Tahun 2018** Tentang Penanganan Sampah Laut. Regulations incorporating a Strategic Plan to reduce marine litter by 70% by 2025. National Strategy Implementation team reports directly to the Presiden.
- **Dutch Network Approach (Inspired by UK Plastics Pack).** Collaboration between the Indonesian and Dutch Government. **Circular Economy** for plastics through **behaviour change** (Ministerie van Infrastructuur en Waterstaat)
- **Global Plastic Action Partnership (GPAP).** Public-Private Collaboration Platform. **Jakarta, Indonesia, 11 March 2019** – The Government of Indonesia, in partnership with the GPAP, today announced **new measures in the country's plan to reduce marine plastic debris by 70%**, reduce solid waste by 30%, and to handle 70% of solid waste by 2025. **Circular Economy** model.

Non-Governmental Initiatives

- **Nexus3/BaliFokus** Foundation. Yuyun Ismawati Drwiega co-founder will be speaking on this later.
- **"Bank Sampahs":** fully integrated into the national waste management strategy. **Bank Sampah App** (4,466 Waste Banks incorporated from 32 Provinces throughout Indonesia)
- **Civil Society groups:** Trash Hero Indonesia
- **Project STOP** (Systemiq and Borealis group, 2017) Works with city governments and technical partners and supporters – Veolia, Sustainable Waste Indonesia, Borouge and mtm plastics. First city partnership launched in March 2018 in Banyuwangi, East Java - focuses on Muncar – fishing port. **Systems and Circular Economy** approach.
- **Bioplastics:** plastic with biomass content

Mitigation Strategy Specific to River Proximity

Findings based on study of Putney on the River Thames pinpoint importance of:

- **Use** of the river location and the surrounding area (Recreational uses, proximity to transit points)
- **Natural** features: windy, slope of land, underground rivers
- **Built** features: drains and sewer system
- **Structural** considerations: waste capture receptacles, walls instead of railings to stop litter from falling into the river
- **Stakeholder engagement**: local council, businesses and community

Bear in mind that addressing issues such as the Citarum River require a different approach.

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Mitigation of Plastic Waste Leakage : Conclusion

- **Summary**: Plastic waste has negative environmental, health and socioeconomic impacts; oceans are currently plastic waste sinks; rivers major pathways for litter; need to reduce the volume of plastic in the waste stream; much-needed global objectives and actions to address plastic waste leakage are underway. The Indonesian government has recognized the issue of marine litter and the importance of a healthy ecosystem. This is reflected in the 2018 Regulation.
- Further research needed on harm to humans and biota caused by ingestion of micro- and nano-plastics. Evidence synthesis (The Royal Society, November 2019).
- Examples of **global initiatives apart from GPAP**: UK government led Commonwealth Clean Ocean Alliance (CCOA) and Global Ocean Alliance.
- Thames 21 (Thames Watch) and Port of London Authority: Monitor health of the **River Thames**. Litter Strategy Sub-Group (influence policy and behavior)
- **Hubbub**: **Rhiannon Ashley**
- **Nexus3/BaliFokus: Yuyun Ismawati**

THANK YOU!