COORDINATING MINISTRY FOR MARITIME & INVESTMENT AFFAIRS
REPUBLIC OF INDONESIA

A New Paradigm :
COMBATING MARINE DEBRIS IN INDONESIA

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WASTE: Local Issue Becoming Global Problem

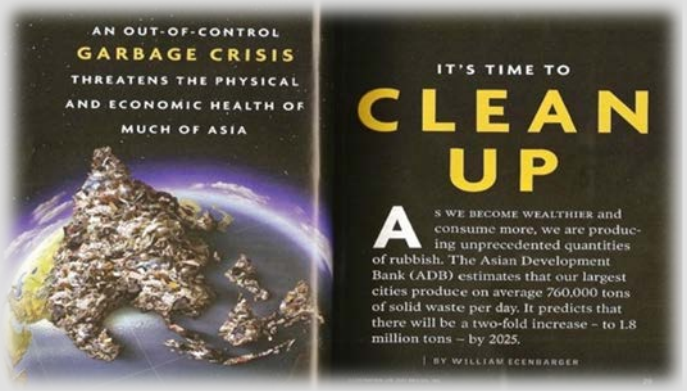
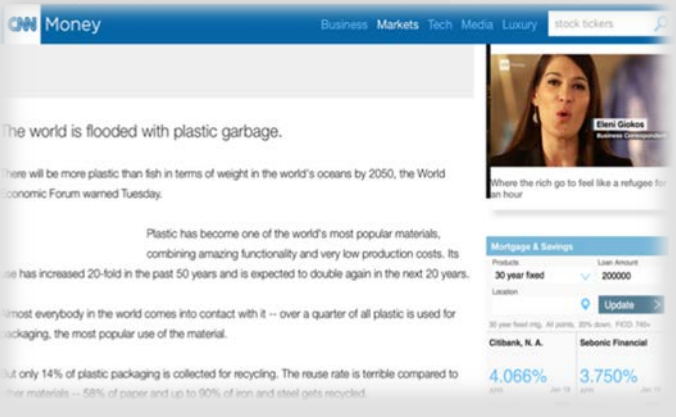


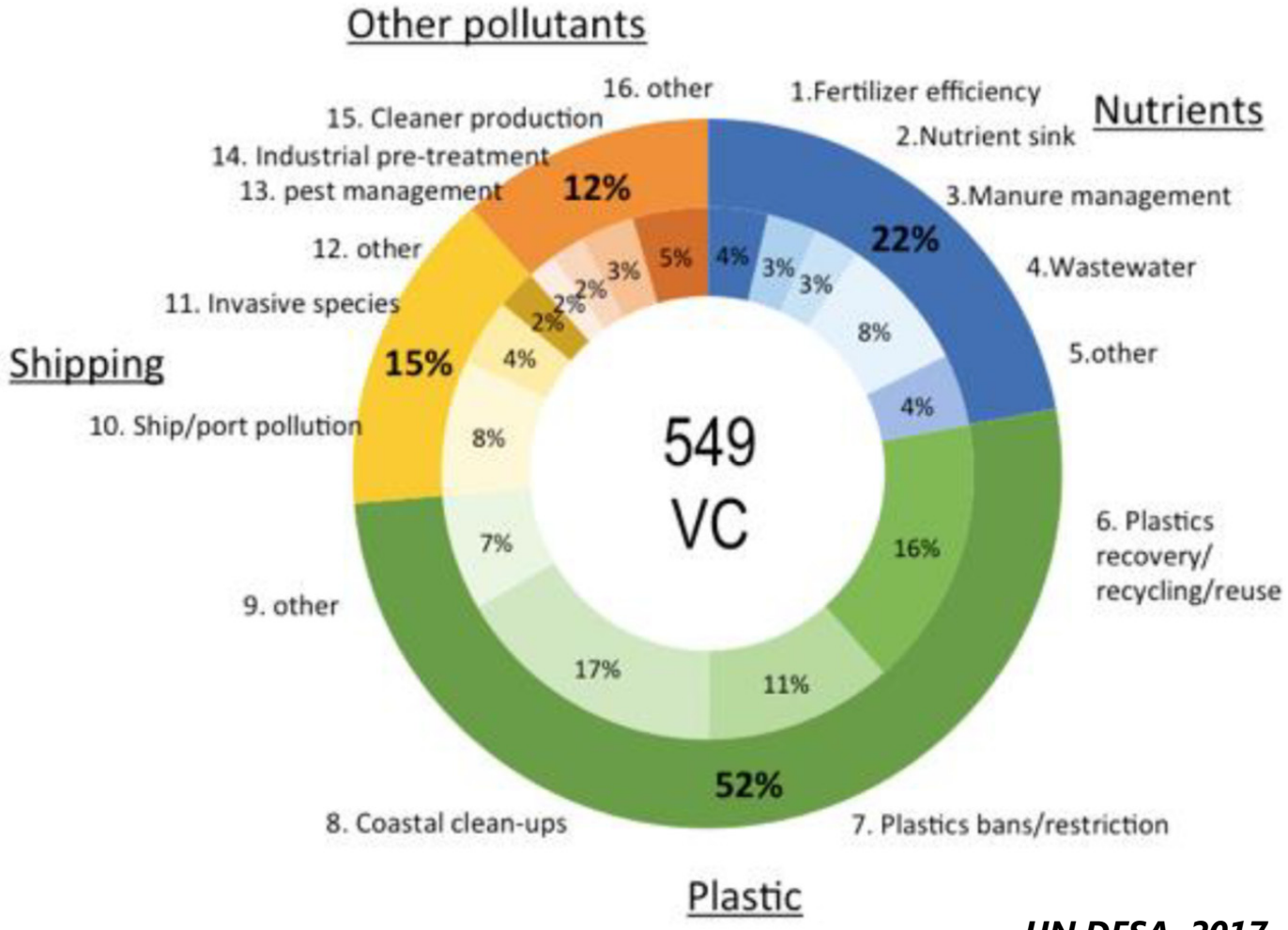
Table 1. Waste estimates for 2010 for the top 20 countries ranked by mass of mismanaged plastic waste (in units of millions of metric tons per year). Econ classif., economic classification; HIC, high income; UMI, upper middle income; LMI, lower middle income; LI, low income (World Bank definitions based on 2010 Gross National Income). Mismanaged waste is the sum of inadequately managed waste plus 2% littering. Total mismanaged plastic waste is calculated for populations within 50 km of the coast in the 192 countries considered. pop., population; gen., generation; ppd, person per day; MMT, million metric tons.

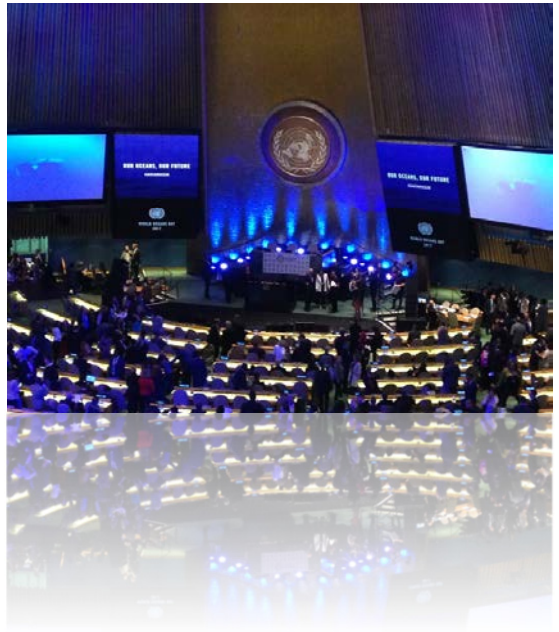
Rank	Country	Econ. classif.	Coastal pop. [millions]	Waste gen. rate [kg/ppd]	% plastic waste	% mismanaged waste	Mismanaged plastic waste [MMT/year]	% of total mismanaged plastic waste	Plastic marine debris [MMT/year]
1	China	UMI	262.9	1.10	11	76	8.82	27.7	1.32–3.53
2	Indonesia	LMI	187.2	0.52	11	83	3.22	10.1	0.48–1.29
3	Philippines	LMI	83.4	0.5	15	83	1.88	5.9	0.28–0.75
4	Vietnam	LMI	55.9	0.79	13	88	1.83	5.8	0.28–0.73
5	Sri Lanka	LMI	14.6	5.1	7	84	1.59	5.0	0.24–0.64
6	Thailand	UMI	26.0	1.2	12	75	1.03	3.2	0.15–0.41
7	Egypt	LMI	21.8	1.37	13	69	0.97	3.0	0.15–0.39
8	Malaysia	UMI	22.9	1.52	13	57	0.94	2.9	0.14–0.37
9	Nigeria	LMI	27.5	0.79	13	83	0.85	2.7	0.13–0.34
10	Bangladesh	LI	70.9	0.43	8	89	0.79	2.5	0.12–0.31
11	South Africa	UMI	12.9	2.0	12	56	0.63	2.0	0.09–0.25
12	India	LMI	187.5	0.34	3	87	0.60	1.9	0.09–0.24
13	Algeria	UMI	16.6	1.2	12	60	0.52	1.6	0.08–0.21
14	Turkey	UMI	34.0	1.77	12	18	0.49	1.5	0.07–0.19
15	Pakistan	LMI	14.6	0.79	13	88	0.48	1.5	0.07–0.19
16	Brazil	UMI	74.7	1.03	16	11	0.47	1.5	0.07–0.19
17	Burma	LI	19.0	0.44	17	89	0.46	1.4	0.07–0.18
18*	Morocco	LMI	17.3	1.46	5	68	0.31	1.0	0.05–0.12
19	North Korea	LI	17.3	0.6	9	90	0.30	1.0	0.05–0.12
20	United States	HIC	112.9	2.58	13	2	0.28	0.9	0.04–0.11

*If considered collectively, coastal European Union countries (29 total) would rank eighteenth on the list



Global Ocean Conference on SDG 14: Target SDG 14.1





UN environment

UN DESA, 2017

Plastic Pollution is about 52 % of global Pollutants

LEAKAGE PLASTIC DEBRIS FROM LAND TO OCEAN IN INDONESIA

150 Millions
popullation

38 Millions
ton/year increase
of garbage

80 %
Leakage of waste
comes from land

17 Ton Millions/year
waste is not organized.

45% waste is throw away to drains, park and burned.

1,29 Millions
ton matrix/year leakage of plastic waste to oceans.

30% Leakage of waste is plastic

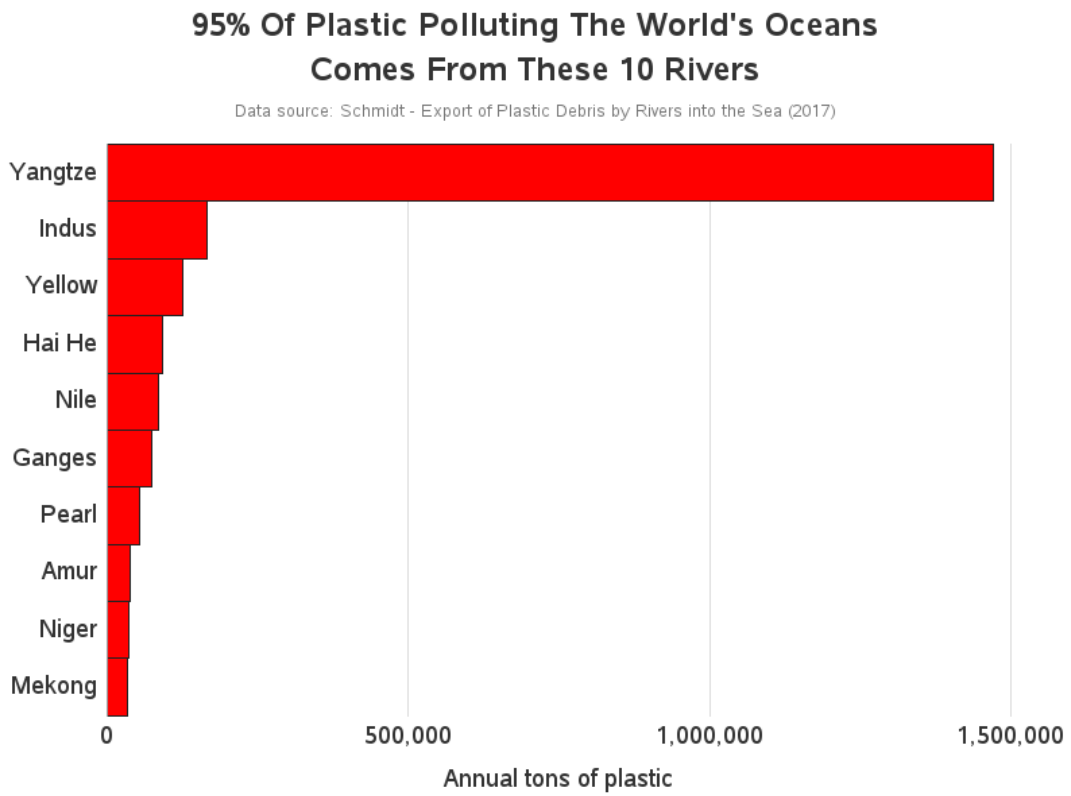
Source: World Bank & LIPI (2017)

Export of Plastic Debris by Rivers into the Oceans

95 % Marine Plastic Pollution (Debris) are Coming From 10 Rivers

By. Schmidt et al , Environ. Sci. Technol., 2017, 51 (21)

Rivers : 8 in Asia and 2 in Africa



The fraction of marine plastic debris originates from land-based sources and rivers potentially act as a major transport pathway for all sizes of plastic debris.

The 10 top-ranked rivers transport 88–95% of the global load into the sea. The global plastic debris inputs form rivers into the sea to range between **0.41 - 4 × 10^6 ton/yr**

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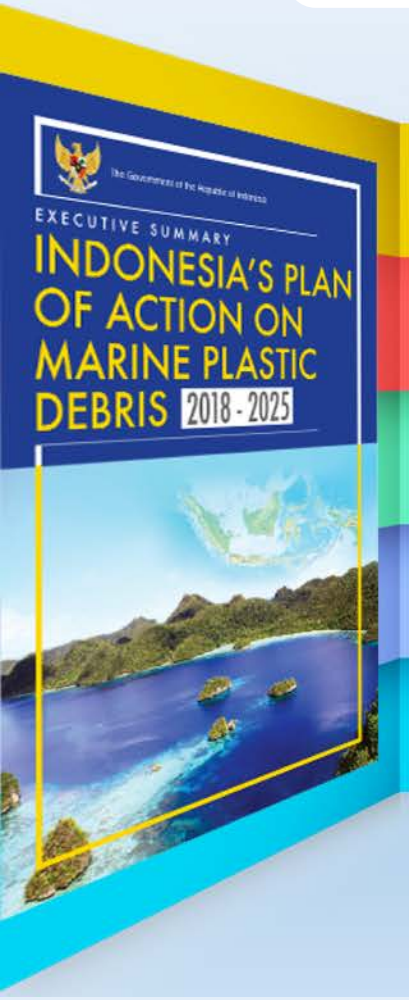
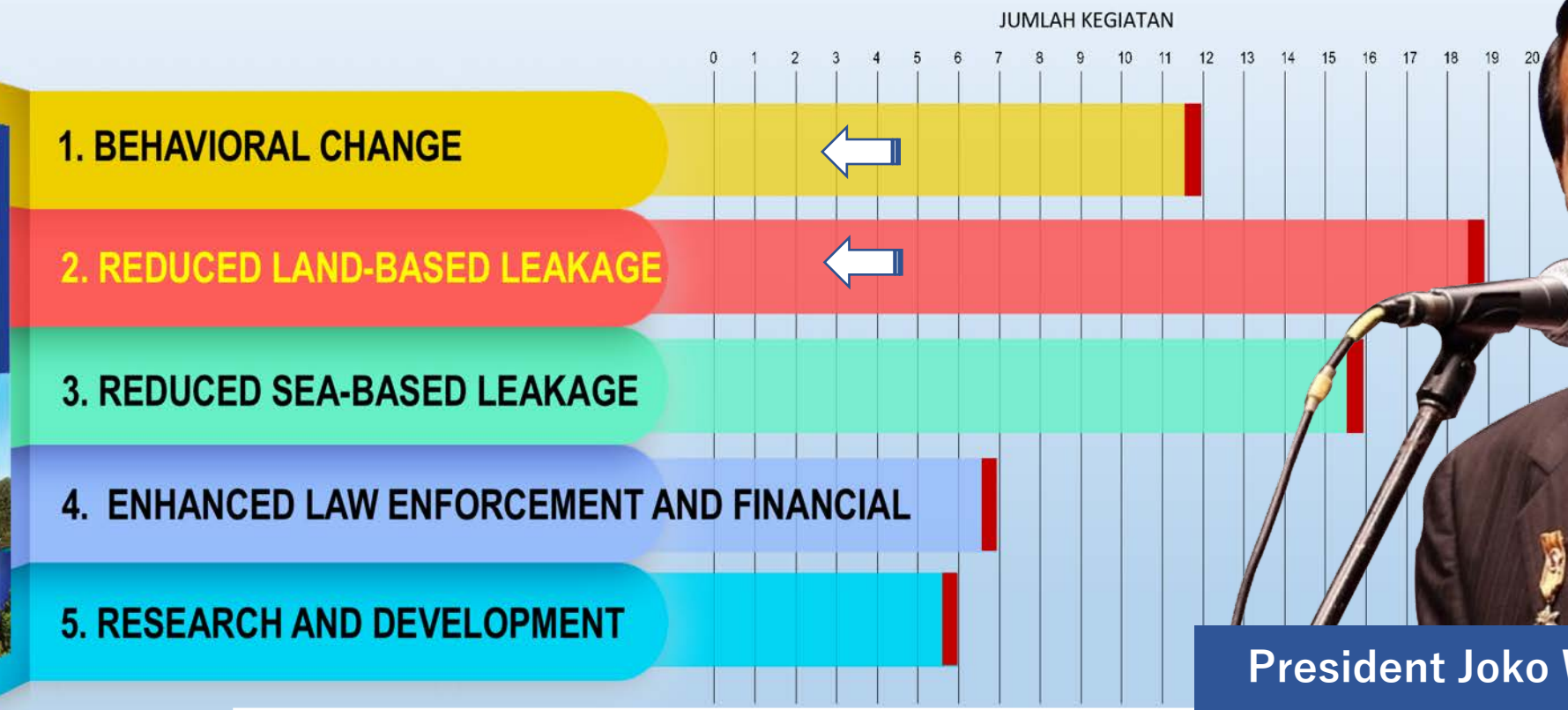
Commitment Of Indonesian Government Combating Marine Plastic Debris

Presidential Decree no.83 / 2018, Combating Marine Debris





President Joko Widodo

" Indonesia will reduce a waste by 3R (*reduce-reuse-recycle*) until 30% to 2025, while target a reduction plastic waste as much as 70% in 2025 "

On *the Leaders Retreat, G20 Summit*, Hamburg-Germany, Friday, 7 July 2017

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National Plan of Actions on Combating Marine Debris - *CITARUM HARUM PROGRAM*

NPAP

Behavioral Change

River Clean up System

Research and Development

Reduced Land-Based Leakage

3R Movements

Enhanced Law Enforcement and Financial

Reduced Sea-Based Leakage

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CITARUM HARUM - River Clean Up Actions

The Citarum river, known as **the most polluted river in Indonesia** (2017)

- The river Citarum **runs over 290 km** from the Wayang Mountain (west Java) to the Java Sea.
- The island's largest river supports **more than 26 million residents** who rely on the water source for agricultural, domestic and personal use.
- **Plastic, packaging, and other detritus floats** in the scummy water, rendering the river's surface invisible beneath its carpet of junk.
- **Need an integrated and comprehensive rapid actions**

ON GOING ….

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CAMPAIGN BEHAVIORAL CHANGE

4 QUALITY EDUCATION

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CAMPAIGN BEHAVIORAL CHANGE

4 QUALITY EDUCATION

Campaign for Save Our Seas, cooperation with Oase

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REDUCED LAND BASED LEAKAGE (Citarum River)

Lake of Cisanti (Citarum Upstream)

BEFORE

DECEMBER 2017

AFTER

FEBRUARY 2018

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REDUCED LAND BASED LEAKAGE (Citarum River)

Location: Bridge of Cijagra, Kab. Bandung

location: Bojongsoang, Kab. Bandung

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Rehabilitation of Citarum River Bank

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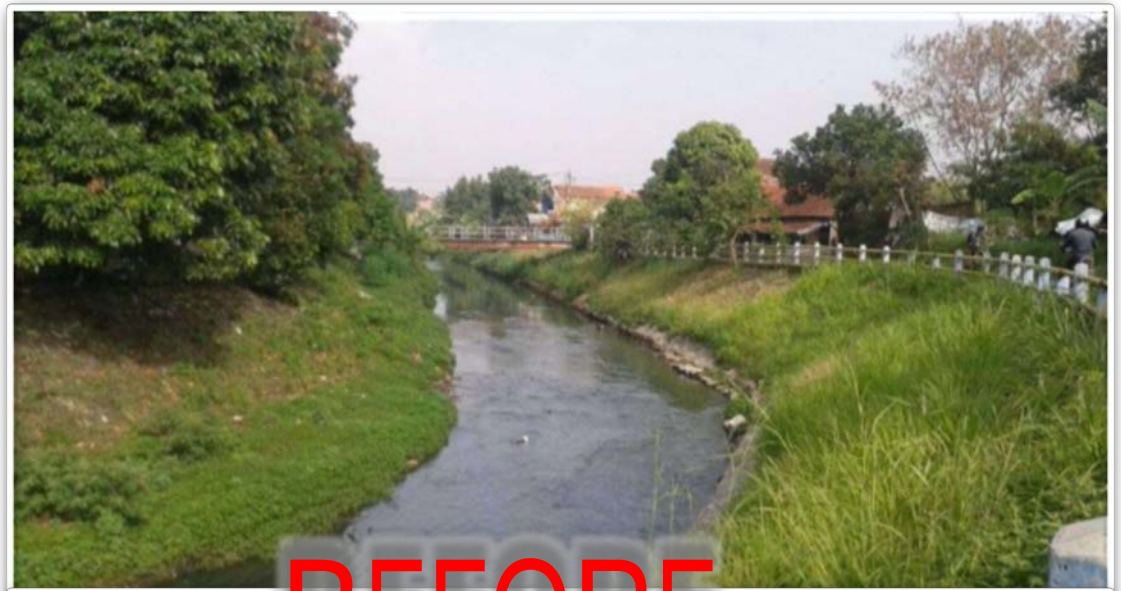
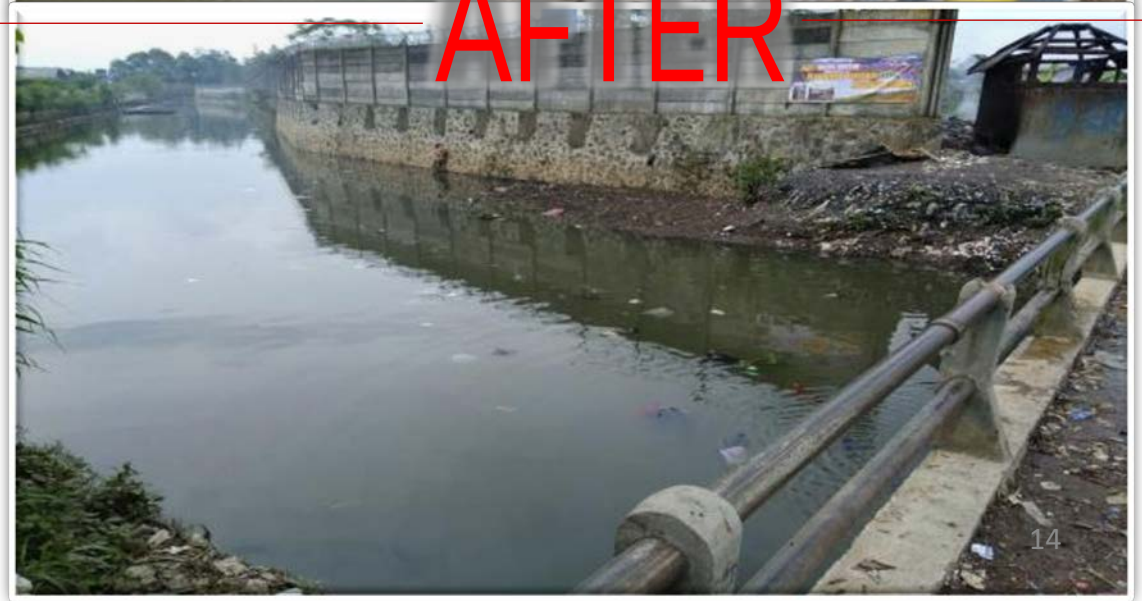
Rehabilitation of Citarum River Bank



BEFORE

AFTER



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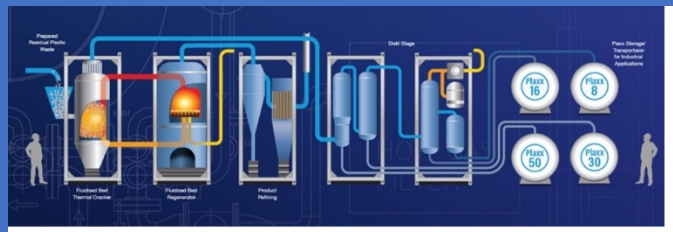
SCIENCE & TECHNOLOGY INTERVENSIONS

Plastic Tar Road

- Process low value plastics into a mixed asphalt road.
- Increasing strength perforate and cheaper.
- **Target: 77 location (~ 700Km road) . Reuse ~ 2100 Ton plastic bag waste**

Waste to Energy

- Destroyed garbage in large amount without causing pollution.
- Produce the electricity from waste burning.
- **Target: 12 Cities (i.e. Jakarta, Bandung, Solo, Denpasar)**



Plastic to Fuel

- Process low value plastics into fuel
- **Target: 2 Cities. Process 100.000 ton plastic waste /year**

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River Clean-Up System

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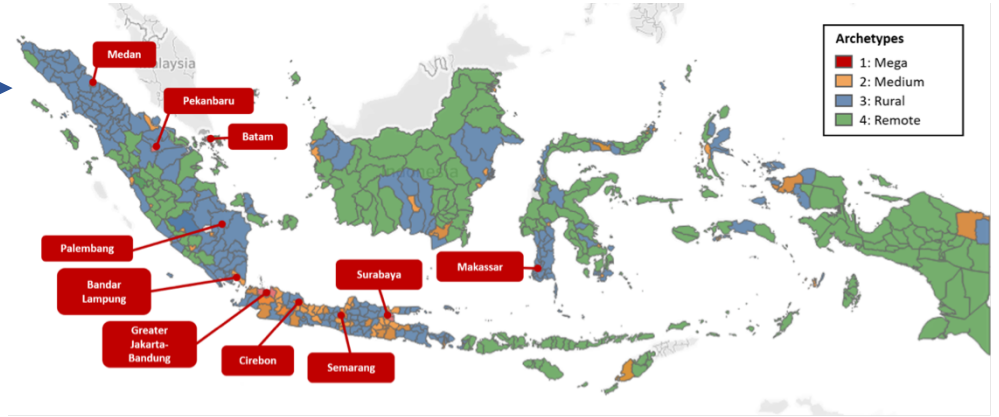
Without Intervention, Plastic Debris Will More Than Double

NPAP level of analysis are kabupaten and kota, and defines 4 archetypes to represent Indonesia's geographical diversity; each will require different sets of solutions

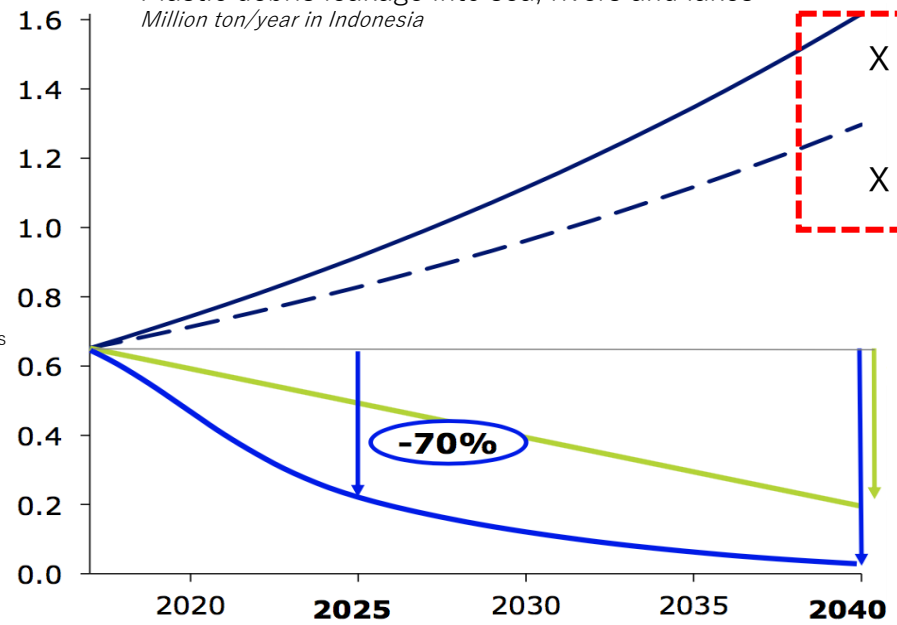
- The red call-outs represent the 10 clusters of Mega archetype



Without intervention, plastic debris will more than double; government Targets 70% reduction instead

SYSTEMIQ analysis

Plastic debris leakage into sea, rivers and lakes[1]
Million ton/year in Indonesia



x 2.5 Plastic leakage if the capacity of the waste system stays the same as today[2]

x 2.2 Plastic leakage if Indonesia invests to keep its Collection rate the same as today at 39%

GPAP calculates two leakage reduction scenarios :

- 70 % — 70% reduction by 2040

Near 0 — Near-Zero leakage by 2040
- 70% reduction in 2025 vs Today
- Near-zero leakage in 2040

1 Translation from 'leakage into sea, rivers and lakes' to 'ocean leakage' is being calculated by World Bank/Deltares in a separate study based on GPAP data

2 Numbers for BAU 'do nothing' and 'maintain' scenarios

Source : GPAP BAU scenario (SYSTEMIQ analysis based on Indonesian government data); Plan of Action on Marine Debris

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Achievements So Far
(October 2018 – September 2019)

1	3.8 % reduction from behavioral change movements	*Clean Indonesia Movement, Indonesia Beach School, Clean-up Actions, etc.*
2	2.8 % reduction of land-based leakage & SWM	*River clean-up systems, Plastic to Fuel, Plastic-tar Roads, Waste to Energy, Integrated Waste Management Model*
3	1.7 % reduction of sea-based leakage	*Waste management & monitoring at Marine Tourism Sites and Commercial Vessels*
4	2.7 % reduction on single use plastics	*Public Private partnerships, National Plastic Action Plan (NPAP), Use of Recycled Plastics, Stopping Illegal Importing of Plastic Wastes*
5	0.2 % reduction of single use plastics from use of biodegradables	*National Standard for Biodegradable plastics, Increased production of biodegradables, Increased Research on impacts of microplastics*

Accumulating to about 11.2% of preliminary joint baseline range (0.49-0.68 Million Tonnes per year), identified by NPAP, The WB, and LIPI


Plastic Tar Road


Waste to Energy


Beach Clean Up


River Clean Up System


Citarum

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THANK YOU !

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The preliminary baseline is based on research from NPAP, World Bank, and LIPI

Modelling based on National datasets:

NPAP (land-based leakage): 0.65 million tons per year
World Bank: 0.68 – 0.86 million tons per year
Early estimate based on first set of field data: LIPI: 0.27 – 0.59 million tons (*initial 18 locations*)

SOURCES

First Preliminary joint Baseline range:
0.49* - 0.86 million tons per year
Leaked into the sea/ocean

0.65 million tons
Range incorporating variability of parameters is being calculated

0.68 – 0.86 million tons

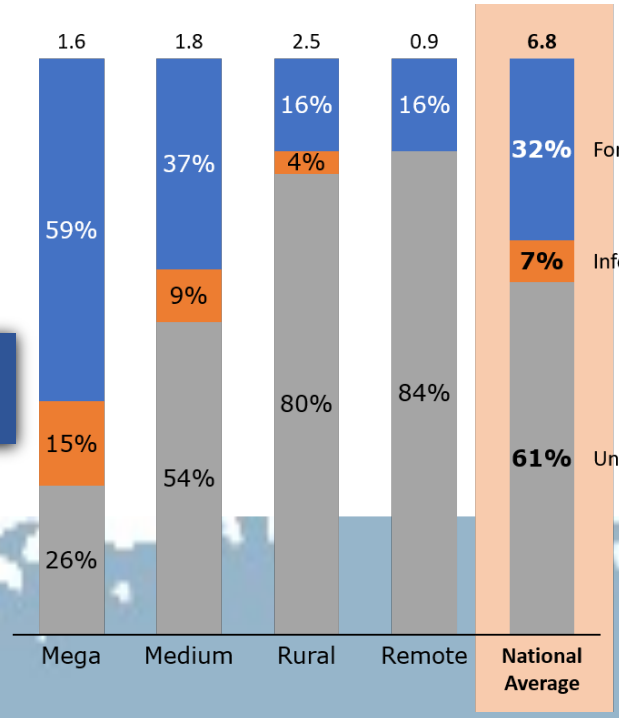
PATHWAYS

0.27 – 0.59 million tons
ased on early field results – 18 locations

STATE of pollution

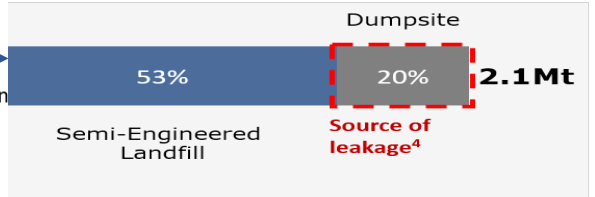
Plastic waste collection rate [1,2,3]

% of total plastic waste generated (million tons/year), 2017

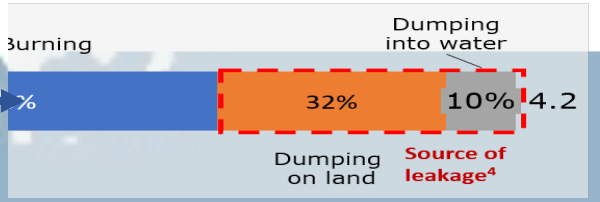


f waste
illion tons/year), 2017

nally collected ends up in dumpsites
l), which becomes source of leakage



d waste is dumped directly into the water and
ly dumped on land, which become sources of



Note: (4) We assume 4% of plastic disposed in dumpsites and 15% plastic dumped on land leak into water bodies
Source: SYSTEMIQ analysis based on: (1) Jakstrada database (2) PUPR (3) World Bank