CIRCULAR ECONOMY AND WASTE MANAGEMENT

Healthier & Happier Society

Mushtaq Ahmed MEMON, UN Environment Programme, Asia and the Pacific Office

UN environment programme

SUSTAINABLE DEVELOPMENT GOALS

SDG 12

Responsible Consumption and Production - & Waste Management (basis for circular economy)

12.3 - By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

12.3.1 - Global food loss index

12.4 - By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

12.4.1 - Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

12.4.2 - Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

12.5 - By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12.5.1 - National recycling rate, tons of material recycled

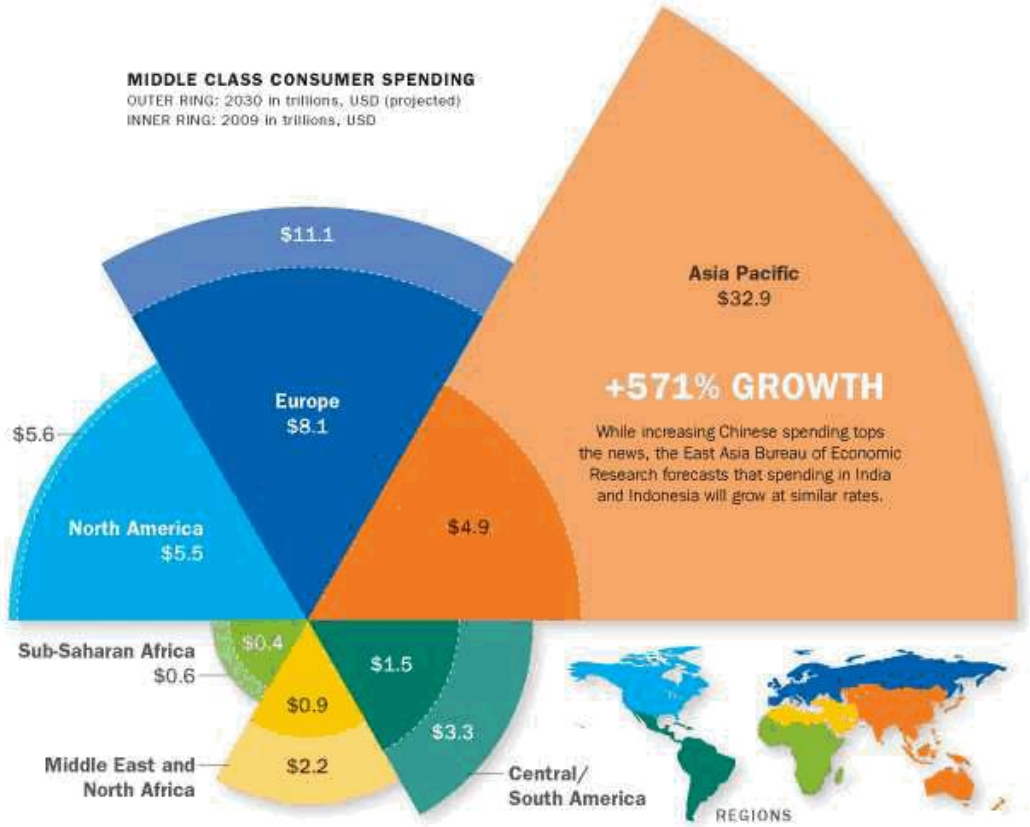
CHANGING SCENARIO....

Growing population from 7 billion today to 9 billion by 2050

Economic development and increasing global trade

Growing middle-class with **changing consumption patterns**

Increasing **consumption of biomass**

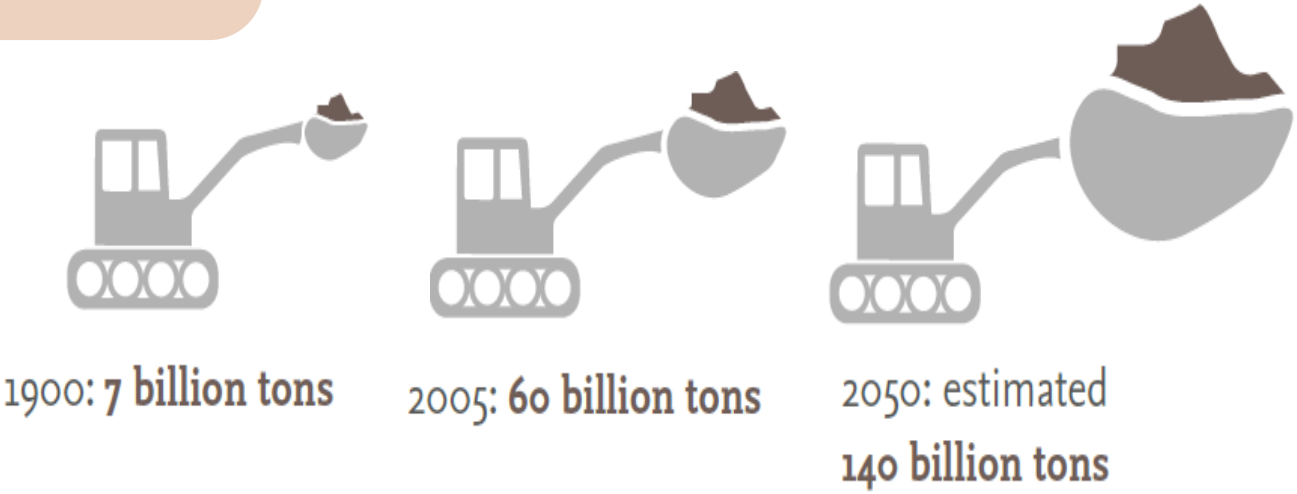


WHAT IS HAPPENING IN ASIA!

UN environment programme

80 billion tonnes of global extraction of natural resources if consumption stays at current developed country rates.

60% of ecosystems damaged or being used unsustainably



* *Materials = fossil fuels, minerals, metals and biomass.*

Two-thirds of the global middle class will be residents in Asia-Pacific by 2030

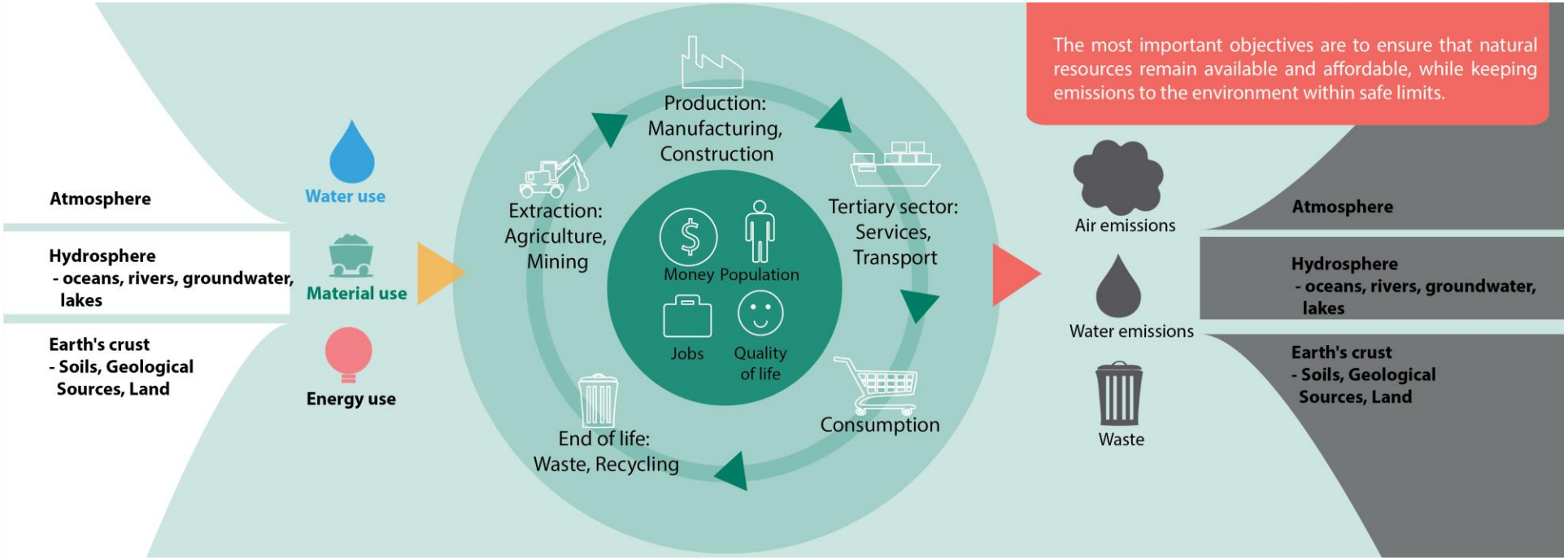
3°C or more rise in Temperature by the end of the century, due to doubling of GHG Emissions by 2050 (BAU)

OVERVIEW

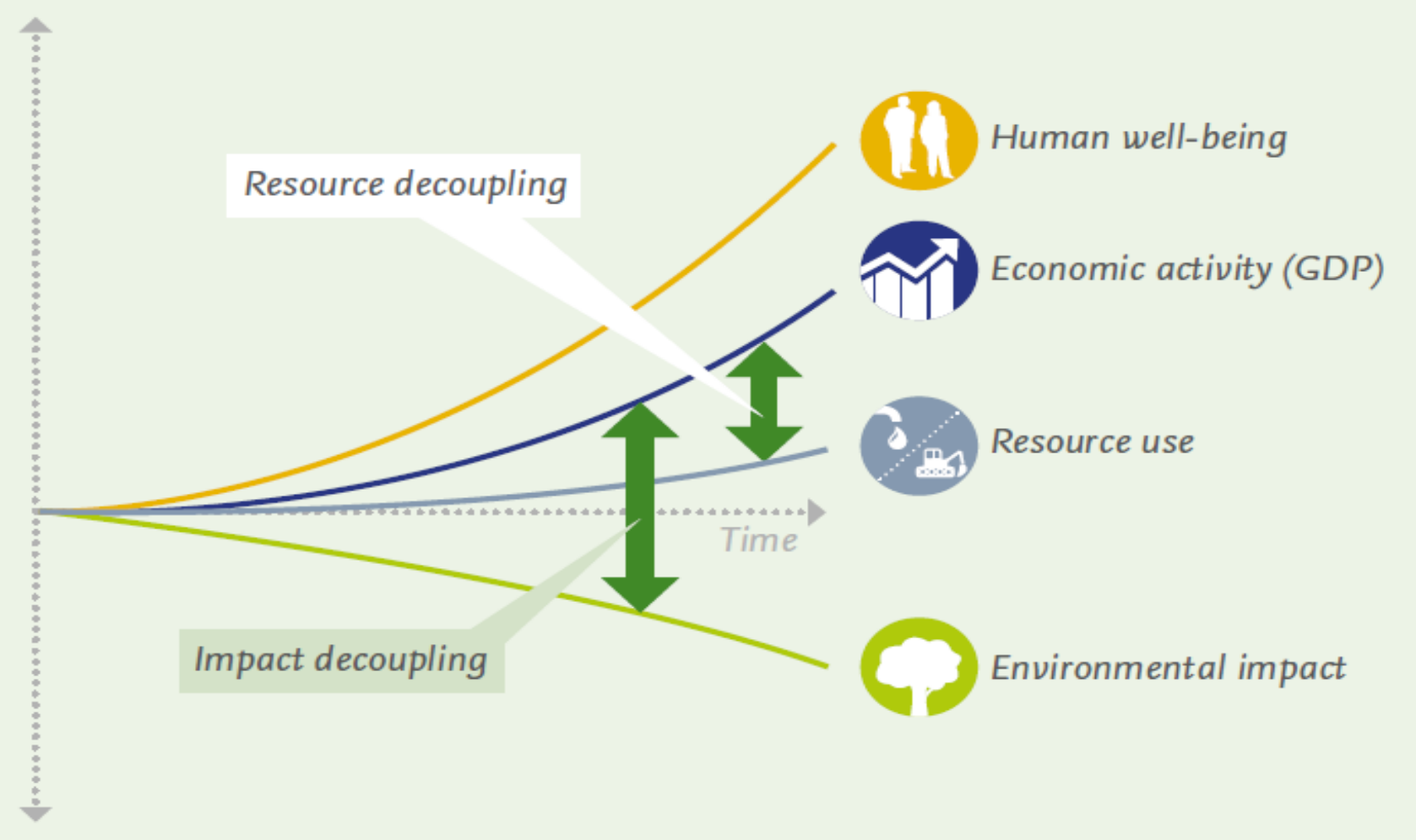
Asia Pacific home to
16 of 28 megacities

Asia Pacific home to
< 4.2 billion people

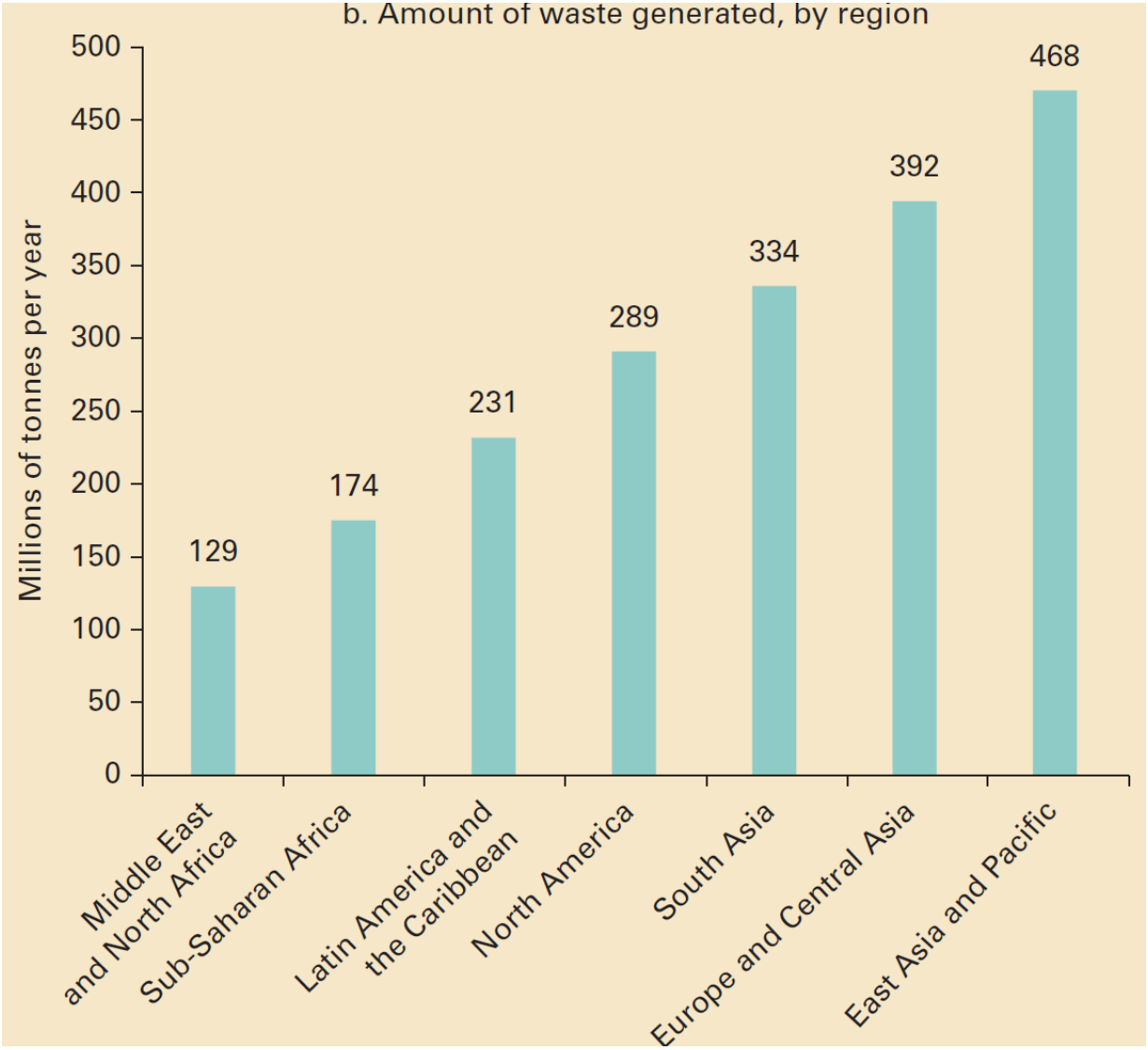
The region's share of global gross domestic product (at purchasing power parity) rose from 30.1% in 2000 to 42.6% in 2017,



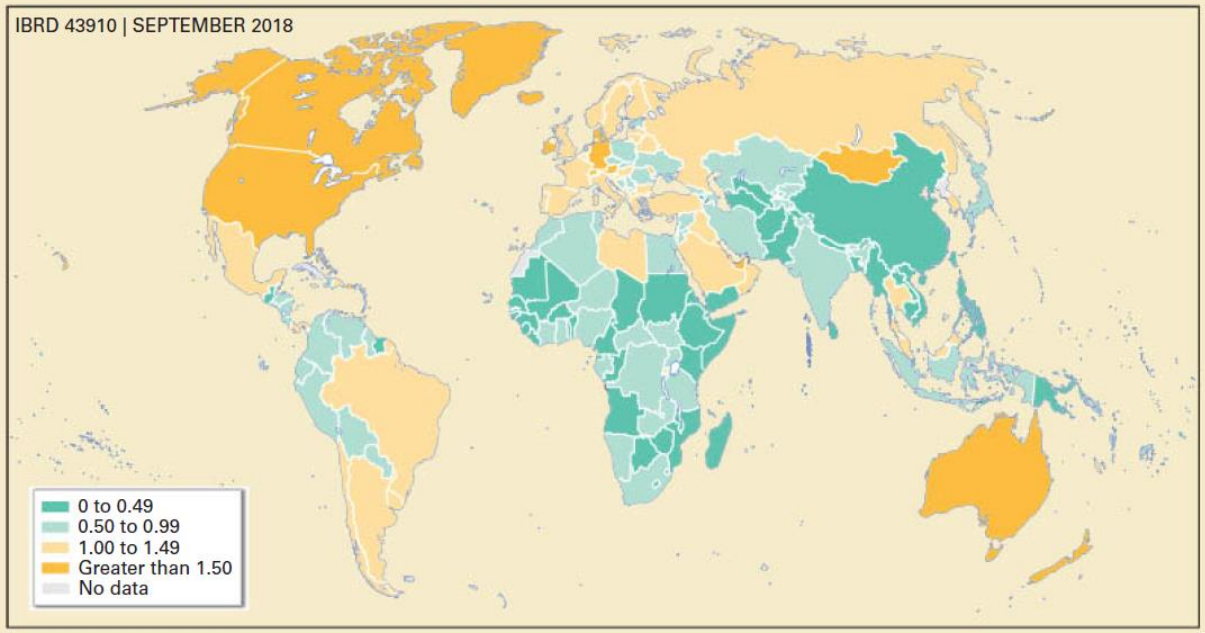
WHAT IS DECOUPLING……



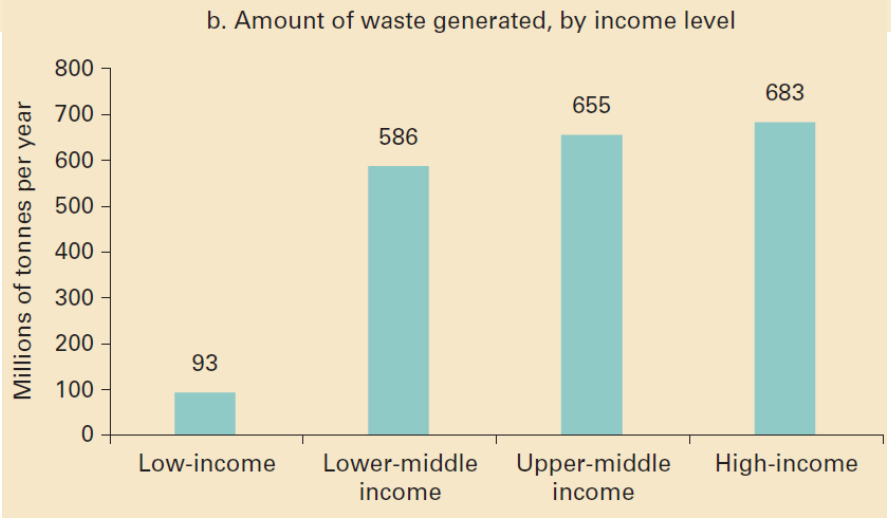
WASTE GENERTION



Map 2.1 **Waste Generation Per Capita**



Note: kg = kilogram.



Source: The World Bank 2018
What a Waste: A Global Snapshot of Global Municipal Waste to 2050

WASTE COMPOSITION

Figure 2.8 Global Waste Composition
percent

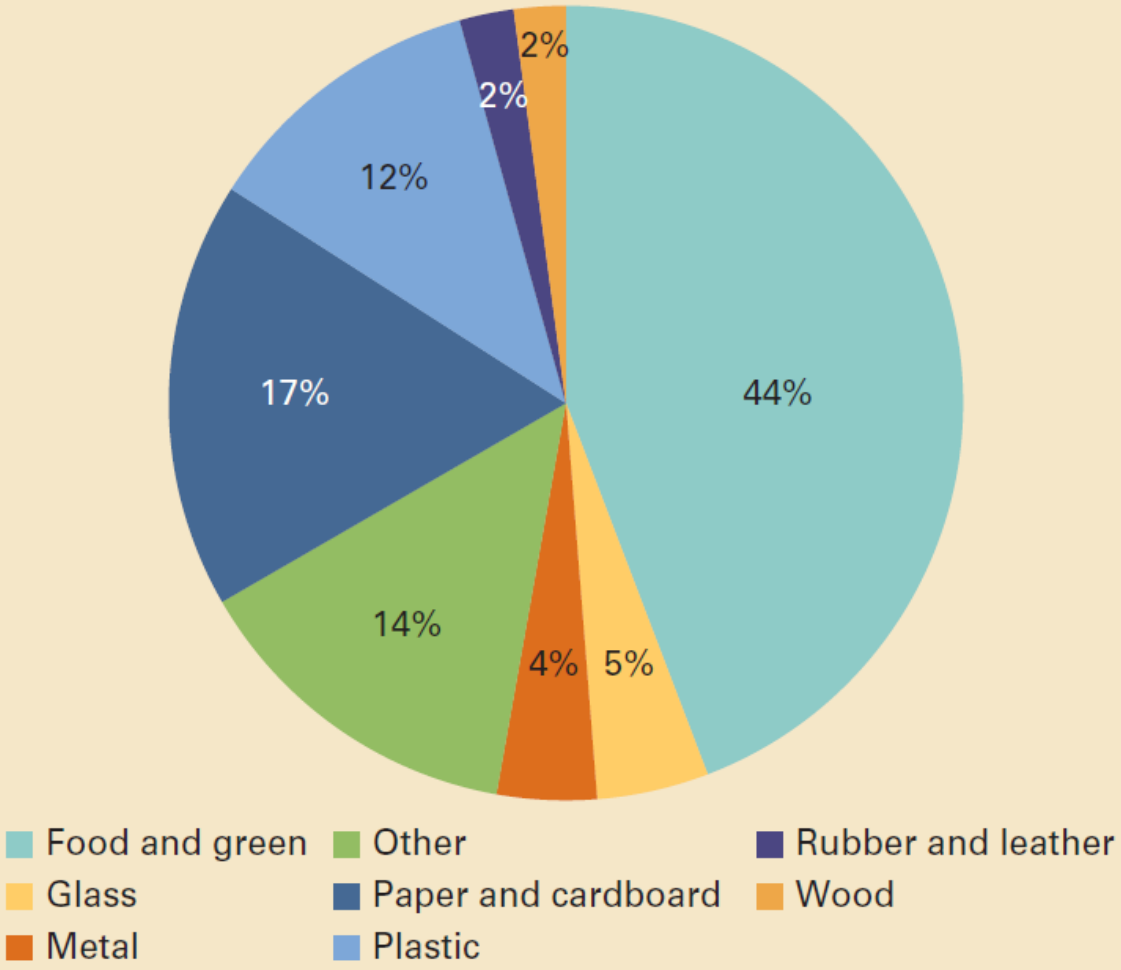
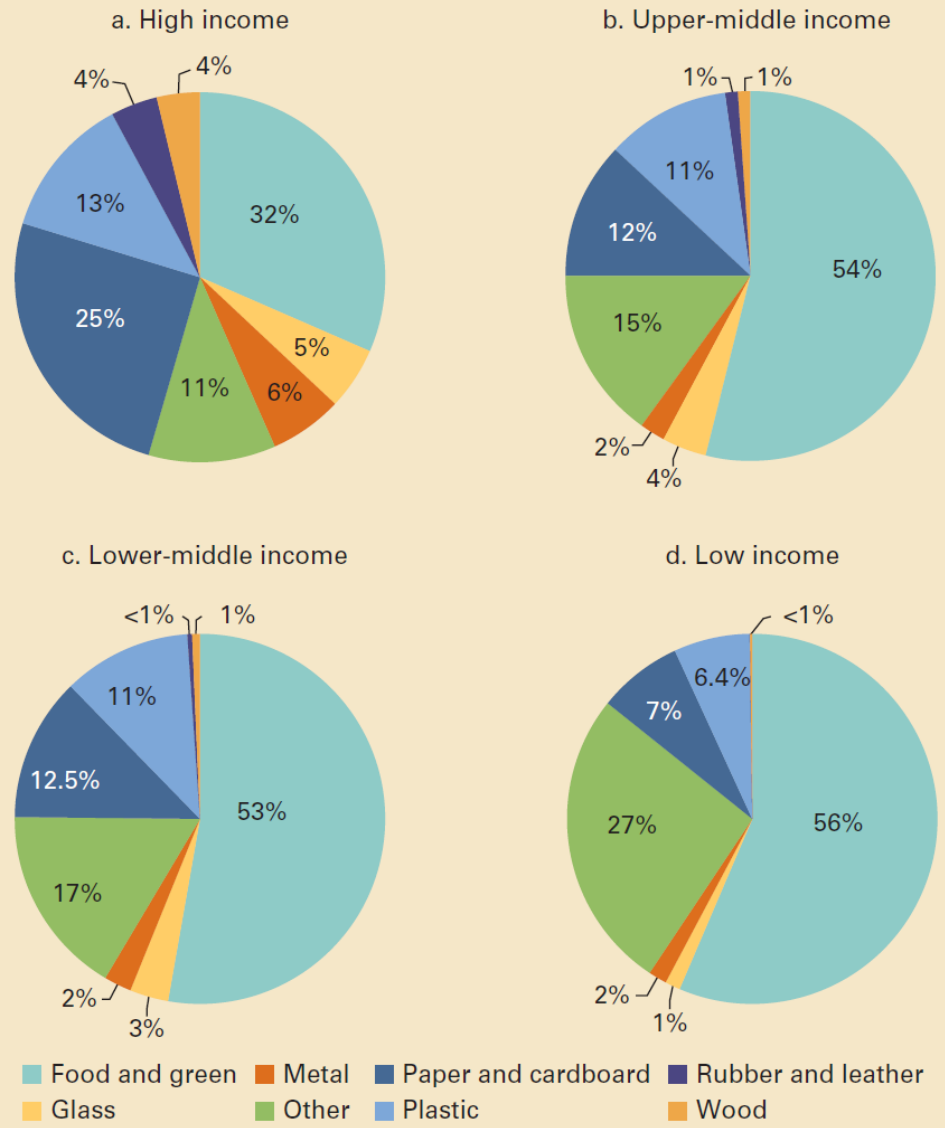


Figure 2.9 Waste Composition by Income Level
percent



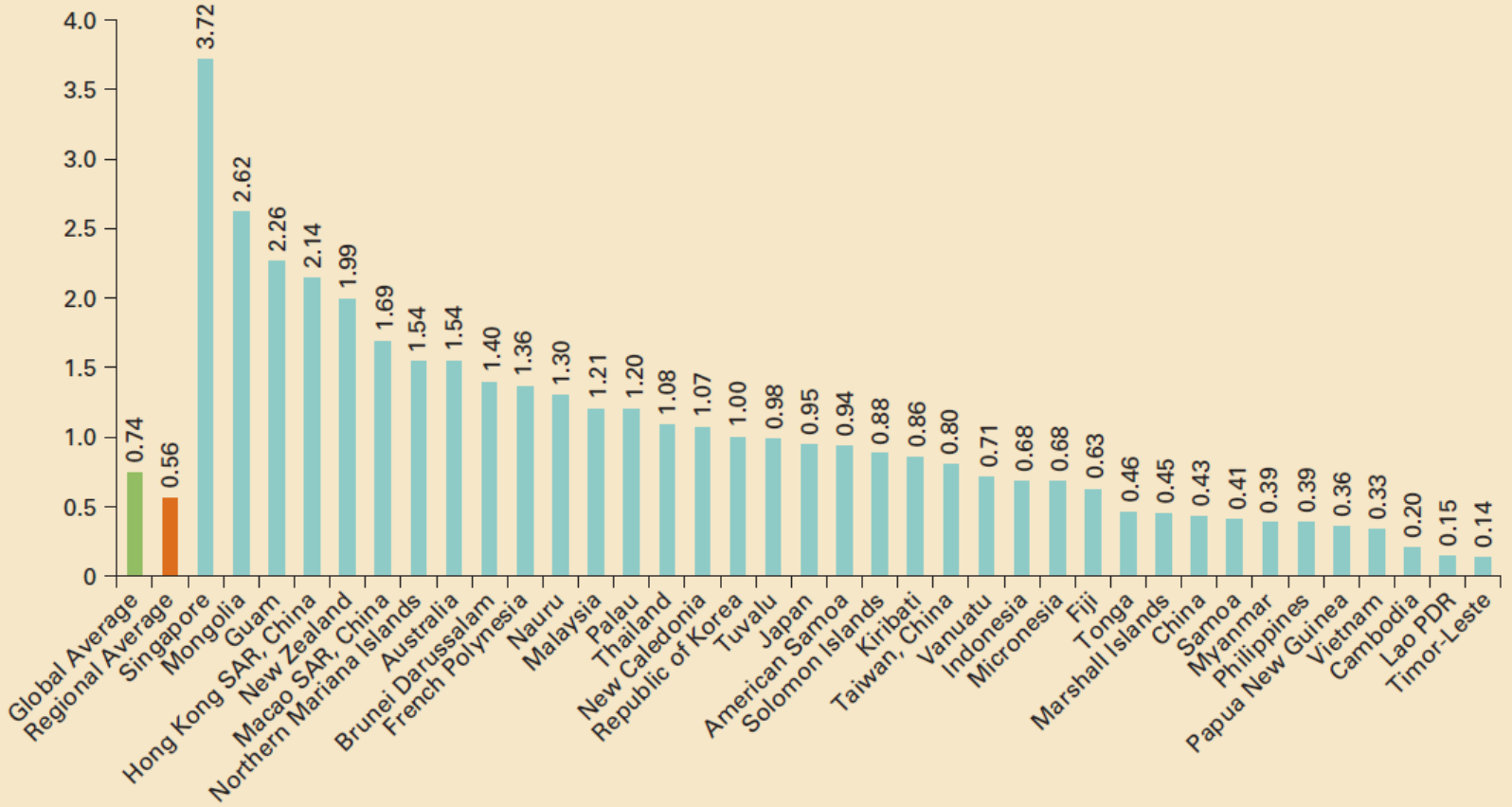
Source: The World Bank 2018
What a Waste: A Global Snapshot of Global Municipal Waste to 2050

SOUTHEAST ASIA AND PACIFIC

UN environment programme

Figure 3.1 Waste Generation Rates: East Asia and Pacific Region

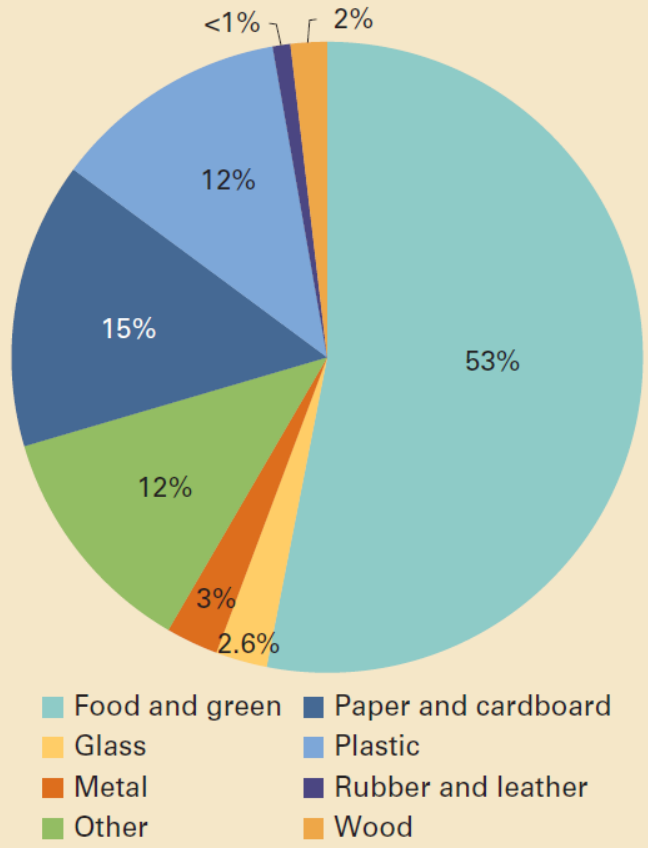
kg/capita/day



Note: Data adjusted to 2016 as described in box 2.1; kg = kilogram.

Figure 3.2 Waste Composition in East Asia and Pacific

percent



Source: The World Bank 2018
What a Waste: A Global Snapshot of Global Municipal Waste to 2050

UNEP's SUPPORT ON WASTE DATA

- Overall figures can be misleading for setting up waste management system comprised of waste reduction, source segregation, collection, transfer station with material recovery, recycling, and final treatment and disposal with recovery. This is similar to overall GDP per capita does not show the details of income distribution and welfare.
- Cities and towns within same country may vary in waste generation and neighbourhoods within same cities and towns may also vary; hence, UNEP produced guidelines and supported capacity building on waste data.
- Data points, waste generation point or collection point or transfer station point or final disposal point, can provide different insights especially countries with informal sector or countries where high value waste is directly sold for reuse and recycling.
- There are rapid changes in waste composition as waste plastics and hazardous waste are increasing rapidly. The figures on waste reduction and waste recycling are also changing.

WASTE COLLECTION AND USER FEES

Figure 2.10 Waste Collection Rates

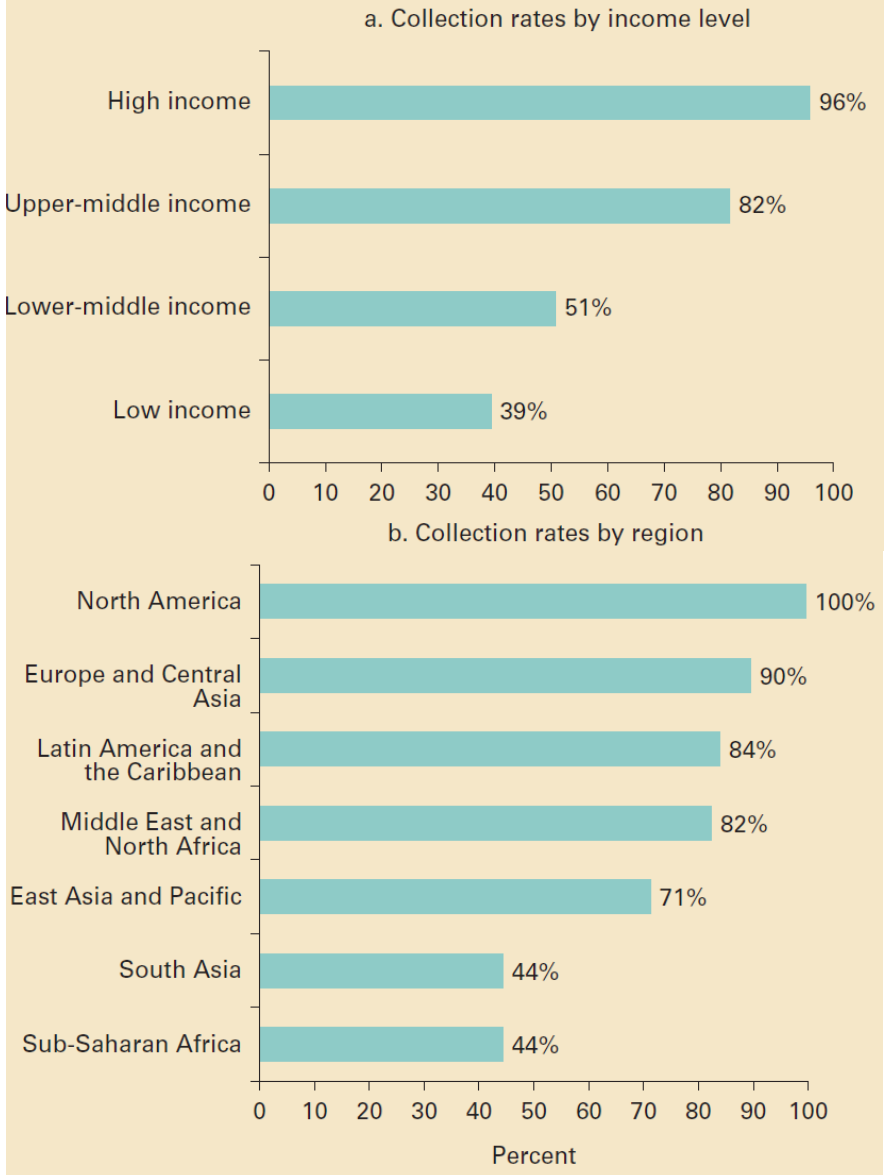


Table 5.4 Waste Management User Fees by Region

Region	Average user fee in selected cities (US$/year, as reported in data)
East Asia and Pacific	46
Europe and Central Asia	83
Latin America and the Caribbean	80
Middle East and North Africa	55
South Asia	34
Sub-Saharan Africa	10–40 (based on World Bank estimates)

Table 5.5 Waste Management User Fees by Income Level

	Average fees, US$ per year	
Income group	Household	Commercial
High income	$168	$314
Upper-middle income	$52	$235
Lower-middle income	$47	$173
Low income	$37	$155

Note: All currency amounts are in US$.

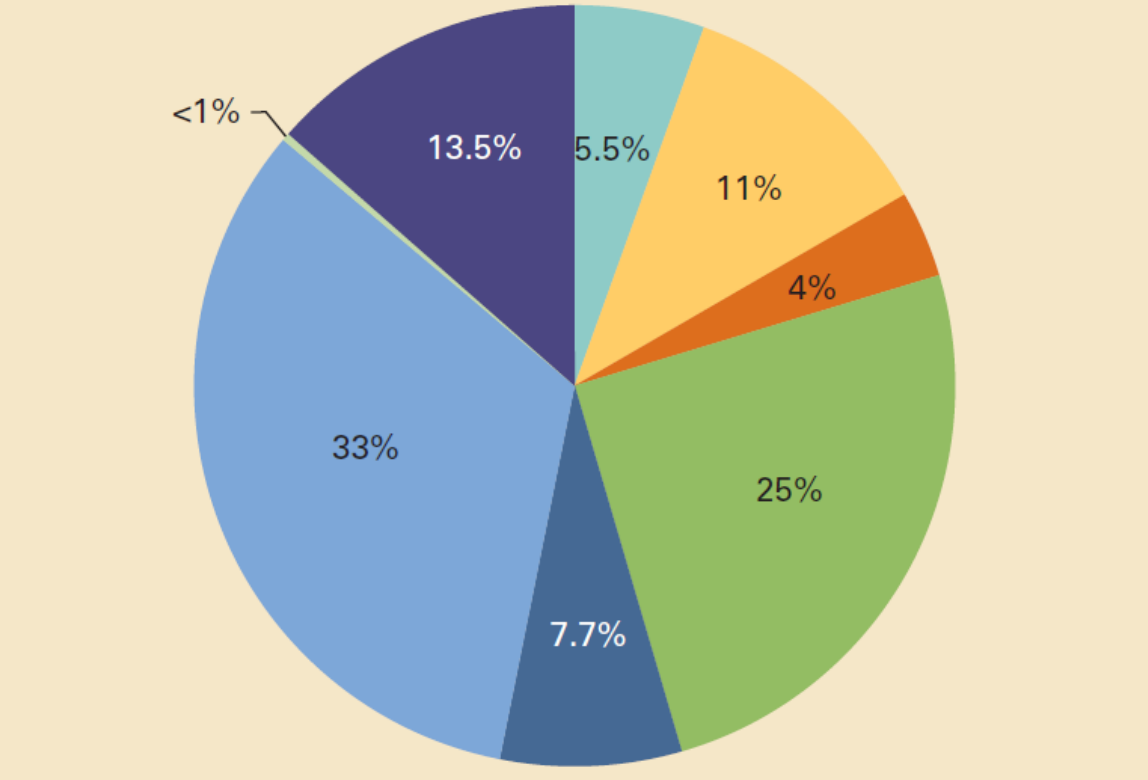
Source: The World Bank 2018
What a Waste: A Global Snapshot of Global Municipal Waste to 2050

WASTE BUDGETS – Key insights from World Bank

- Basic solid waste management systems covering collection, transport, and sanitary disposal in low-income countries cost $35 per tonne at a minimum and often much more.
- Solid waste management is a large expenditure item for cities and typically comprises nearly 20 percent of municipal budgets in low-income countries, more than 10 percent in middle-income countries, and 4 percent in high-income countries. Budgets can be much higher in certain cases.
- Systems that include more advanced approaches for waste treatment and recycling cost more, from $50 to $100 per tonne or more. The choice of waste management methodology and technology depends highly on the local context and capacity for investments and ongoing management.
- User fees range from an average of $35 per year in low-income countries to $170 per year in high-income countries. Full cost recovery from user fees is largely limited to high-income countries. Almost all low-income countries, and a limited number of high-income countries, such as the Republic of Korea and Japan, subsidize domestic waste management from national or local budgets.
- Although public-private partnerships could potentially reduce the burden on local government budgets, they could result in compromises in service quality when not structured and managed properly.
- Local governments provide about 50 percent of investments for waste services, and the remainder is typically provided through national government subsidies and the private sector.
- When political support for increasing user fees for households to cost recovery levels is limited, cross-subsidizing from payments by waste generators (for example, the commercial sector) can help reduce the burden on local government budgets. Commercial fees range from about $150 per year in low-income countries to $300 in high-income countries.
- Volume-based waste fees have been successful in countries like Austria, Korea, and the Netherlands but are still uncommon because they require coordinated planning and strong enforcement. Households and commercial institutions in low-income countries are typically charged a flat fee that is collected on a door-to-door basis.

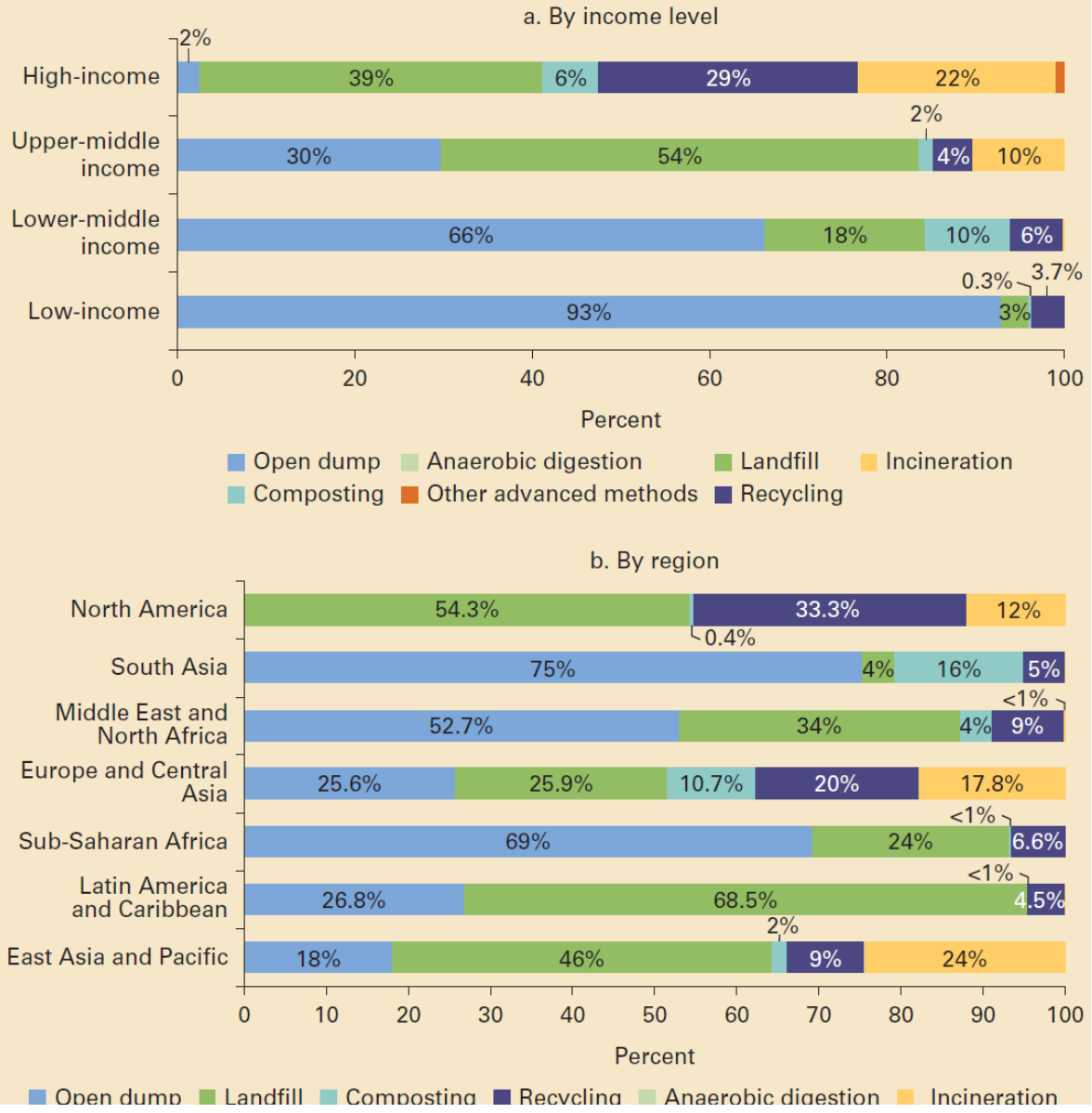
RECYCLING STATUS

Figure 2.12 Global Waste Treatment and Disposal
percent



Source: The World Bank 2018
What a Waste: A Global Snapshot of Global Municipal Waste to 2050

Figure 2.13 Disposal Methods by Income



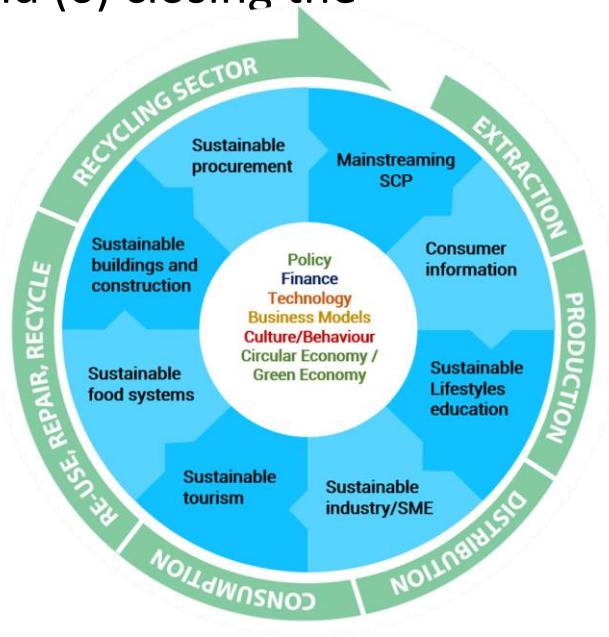
RECYCLING TARGETS

According to a report compiled by Eunomia, Germany is leading the world recycling chart, with an impressive recycling rate of 56.1%. Austria comes second, with 53.8%. These countries recycle between 52% and 56% of their municipal waste, with Switzerland recycling almost 50%. To support their country's impressive recycling rates, paper suppliers in Germany provide environmentally-friendly, biodegradable, and recyclable products, including Kraft paper, newsprint and wood-free.

Accessed on 27 October 2019
https://www.pgpaper.com/global-recycling-rates/

UNEP SUPPORT ON WASTE MANAGEMENT SYSTEM

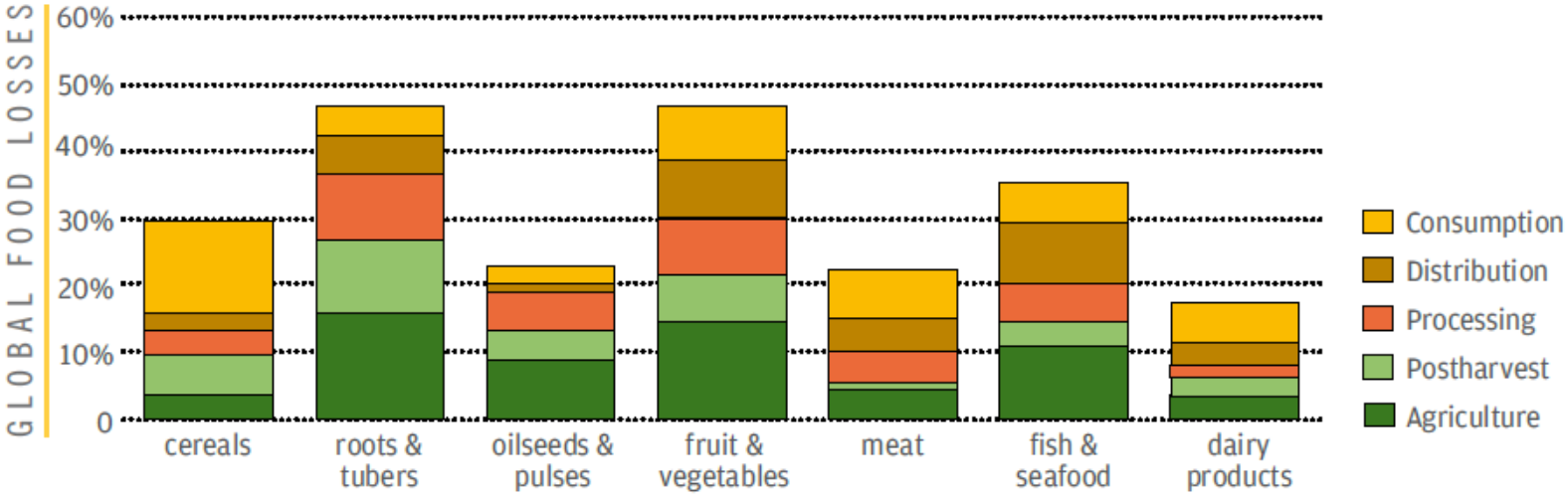
- UNEP produced guidelines and training materials with pilot support to assess the waste management system and gaps there in for regulations, financing, technology, institutionalisation, and stakeholders' roles and engagement for integrated waste management and for major waste streams including municipal waste, waste plastics, E-waste, and waste agricultural biomass.
- For pilot cities, capacity were built on waste data, assessment of waste management system, target setting, stakeholders' concerns for achieving targets and formulating integrated waste management plan to strengthen current waste management system.
- Major lessons learned from UNEP's capacity building and pilot projects including (1) political will, (2) stakeholder engagement, (3) raising awareness on health and environment impacts of waste, (4) waste management shall be based on polluter pay principle, (5) waste is not a resource worthy of generating but to manage waste efficiently, it has to be treated as a resource, and (6) closing the loop as local as possible to reduce negative impacts of even recycling.



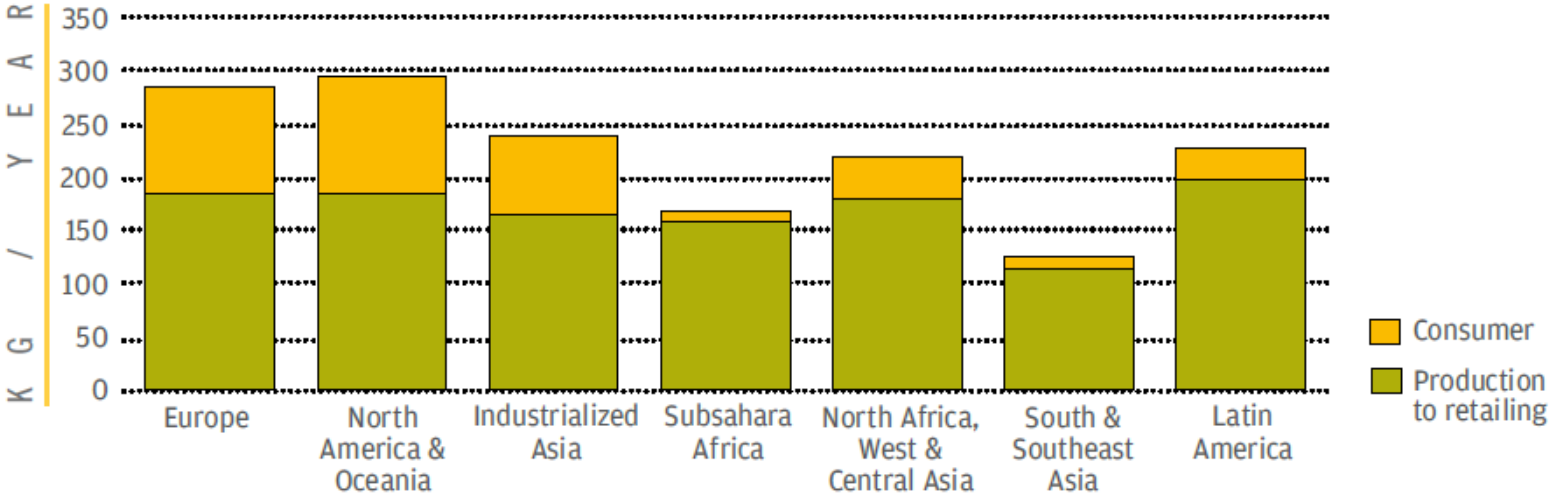
FOOD LOSS AND FOOD WASTE (12.3)

UN environment programme

PART OF THE INITIAL GLOBAL PRODUCTION LOST OR WASTED



PER CAPITA FOOD LOSSES AND WASTE, AT CONSUMPTION AND PRE-CONSUMPTION STAGES



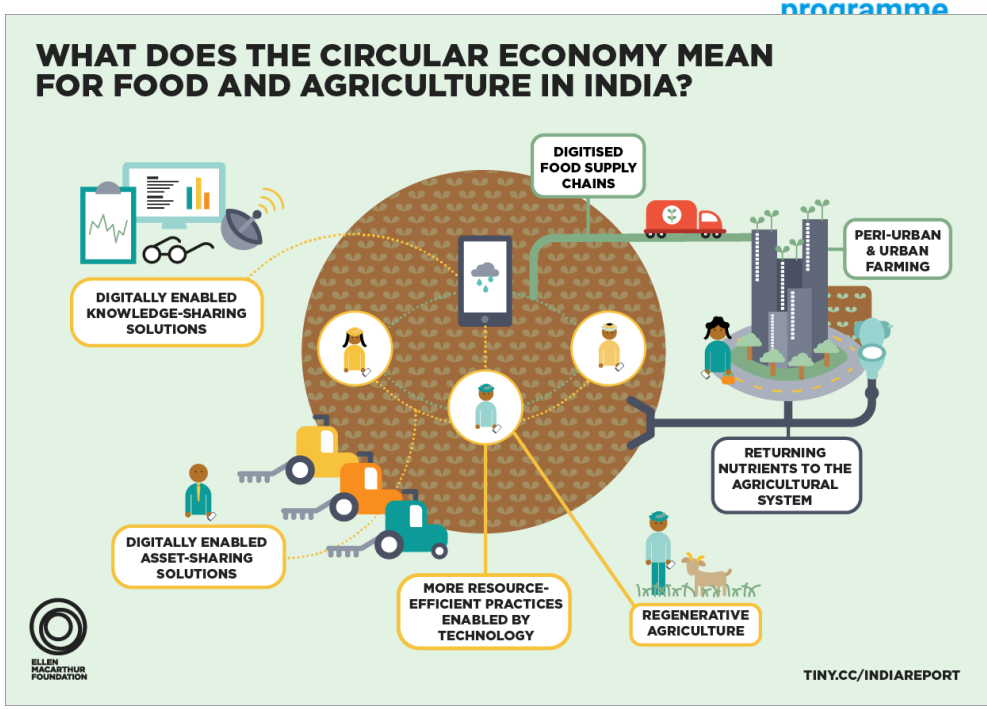
SUPPORT ON FOOD WASTE MANAGEMENT

- UNEP's focus on upstream to reduce food waste and downstream to convert food waste into a resource to close the loop.

- UNEP, under the Circular Economy concept, is supporting circular economy in agriculture and food sector to reduce food loss and food waste and to recycle back waste food into agricultural process and animal feed.

- UNEP has comprehensive support on waste agricultural biomass.

- Through SDG 12 and 10 Year Framework on Sustainable Consumption and Production, UNEP provides support on sustainable food systems.



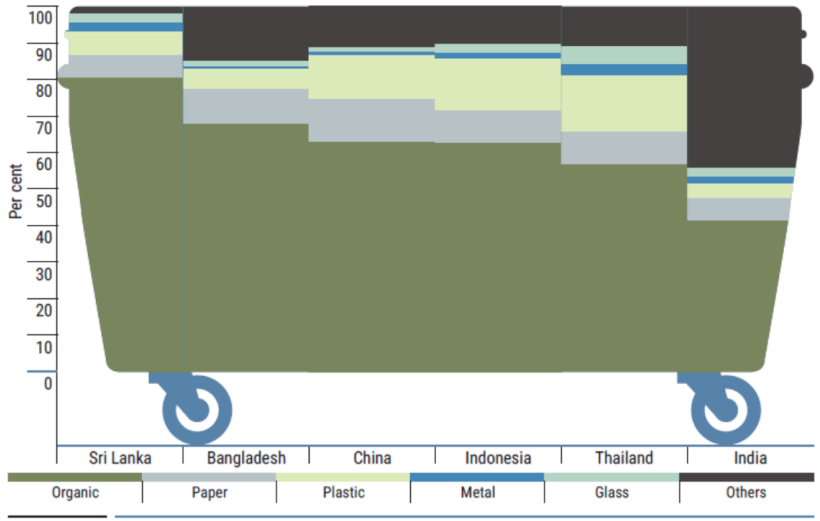


Figure 2.5 : Waste Composition in Various Countries in Asia

Source: Seventh Regional 3R Forum in Asia and the Pacific (Nov 2016).

WASTE PLASTICS

8.3 billion tonnes of plastic have been produced, using 17 million barrels oil each year

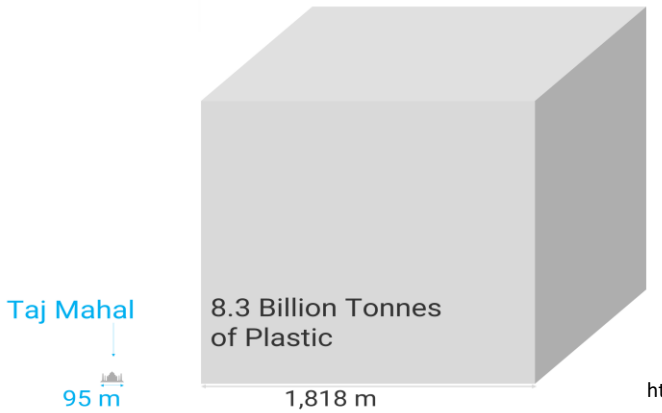
80% remains in landfills or the environment, 100 years for plastic to degrade in the environment, 13 million tonnes of plastic enter ocean each year

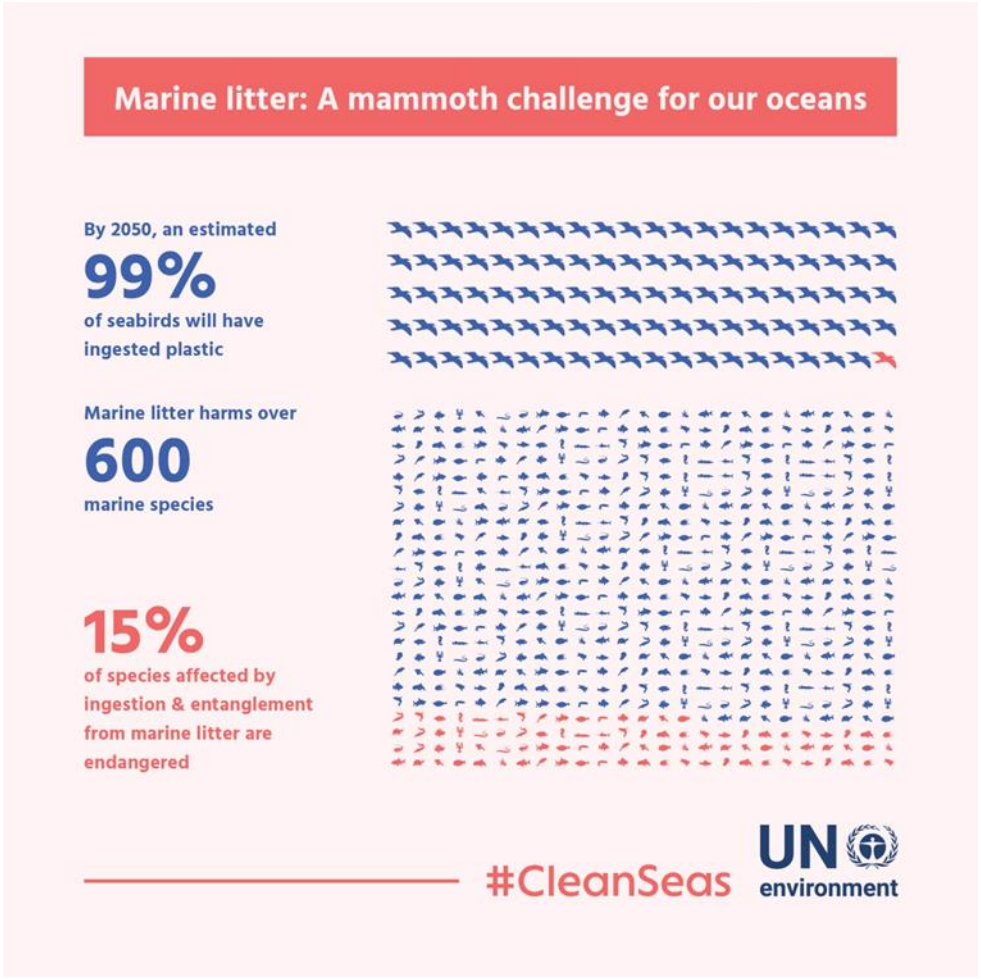
1 million plastic bottles, 10 million plastic bags bought every minute

50% of consumer plastics are single use, and 10% of all human-generated waste is plastic

100,000 marine animals killed by plastics each year

90% of bottled water found to contain plastic particles, 83% of tap water





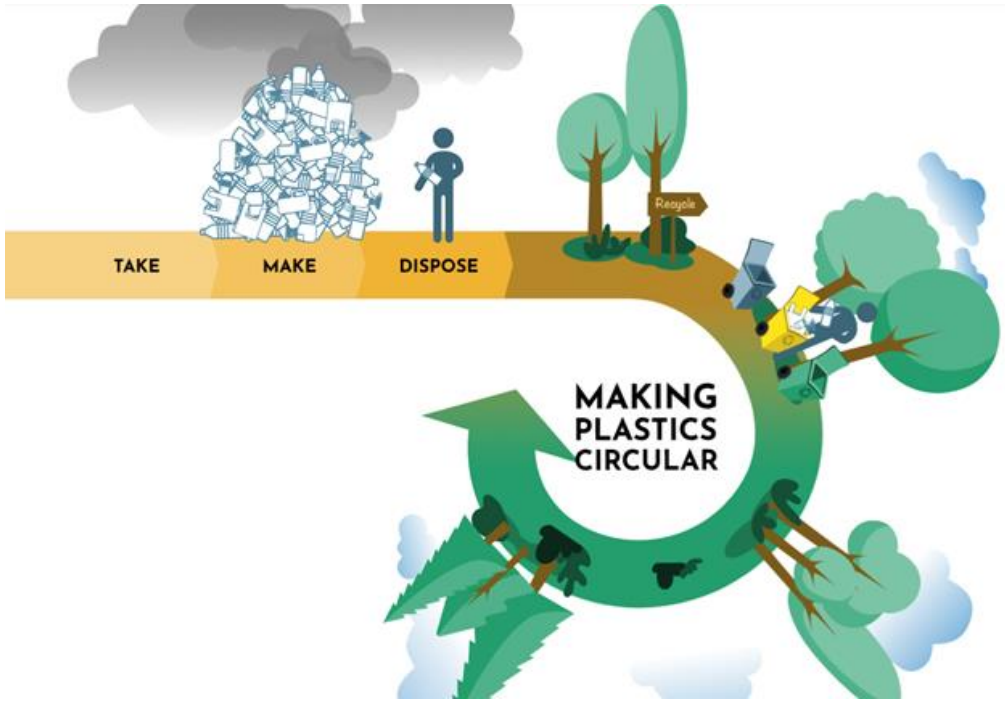
http://worldenvironmentday.global/sites/default/files/toolkit_with_nature/wed_key_messages_english.pdf

SUPPORT ON WASTE PLASTICS MANAGEMENT

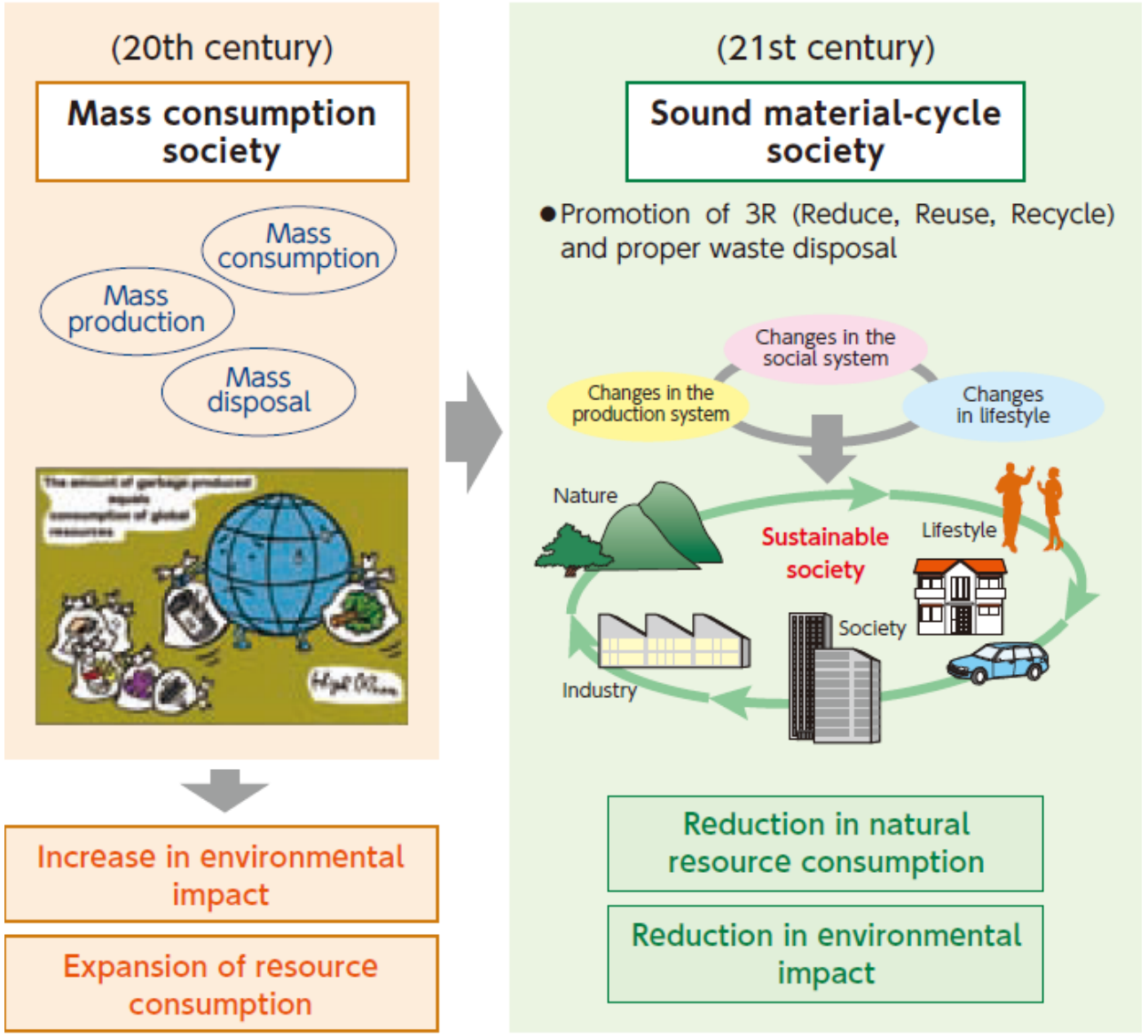
- UNEP's focus on upstream to reduce waste plastics and downstream to convert waste waste into a resource to close the loop.

- UNEP, under the Circular Economy concept, is supporting circular economy for plastics to assist in reducing wasted plastics and to increase cycling value of plastics by continuous recycling.

- UNEP has comprehensive support on waste plastics through various offices and initiatives including lifecycle initiative, Norwegian supported initiative on marine litter, SIDA supported project on plastic pollution and marine plastics, Japan supported counter-measure project for marine plastics, and EU funded SWITCH-Asia projects



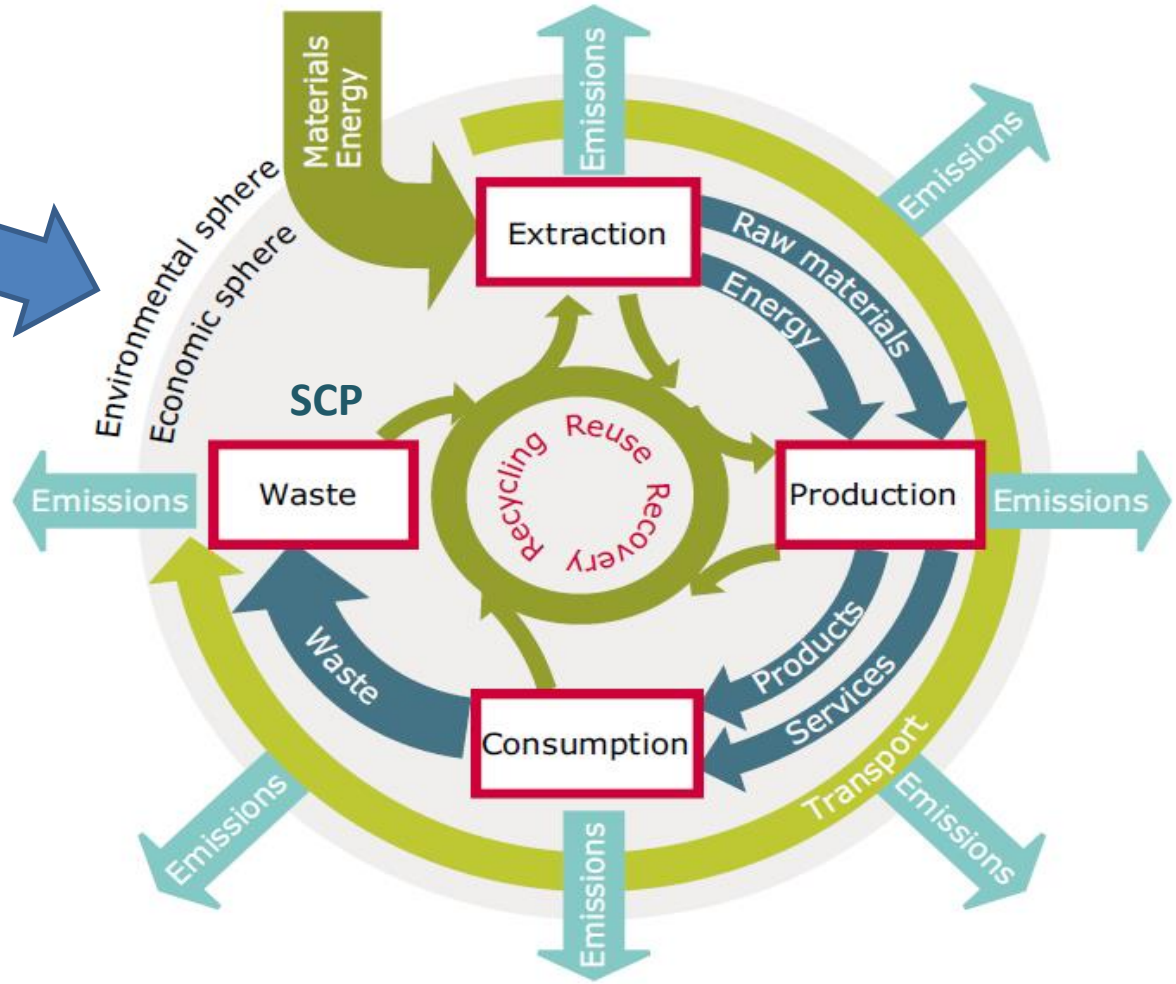
Moving towards Resource Management



History and Current State of Waste Management in Japan, MOEJ (2014)

DECOUPLING THROUGH CIRCULAR ECONOMY

- Policy
- Technology
- Standards
- MEPS
- Regulations
- Incentives
- Private sector engagement
- Access to finance



CIRCULAR ECONOMY ASIA PACIFIC (CEAP)

UN environment programme

The Challenges

Natural Resources

In 2015, Asia and the Pacfic represents 63% of global material use.

GHG emissions

330% GHG emissions from the region grew by 330%, including increase in short-lived climate pollutants

Plastic

6,300 Mt of plastic waste has been generated as of 2015. Of this waste, 9% has been recycled, 12% incinerated, and 79% has accumulated in landfills or the natural environment.

Air pollution

70% Air pollution is responsible for more than 6.5 million deaths annually, the bulk of which – 70 %– occurs in Asia Pacific.

Source: APCAP, 2018

Circular Economy and the 2030 Agenda

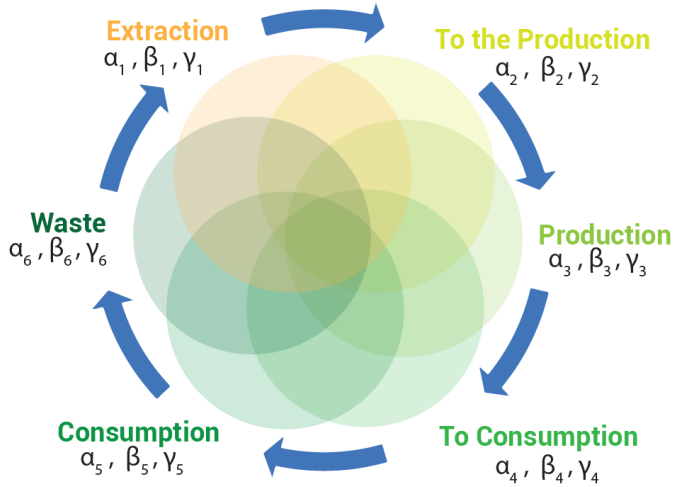
SDG 12 Responsible Consumption and Production

Current

Linear & Inefficient

Extraction $\alpha_1, \beta_1, \gamma_1$ → Transport $\alpha_2, \beta_2, \gamma_2$ → Production $\alpha_3, \beta_3, \gamma_3$ → Transport $\alpha_4, \beta_4, \gamma_4$ → Consumption $\alpha_5, \beta_5, \gamma_5$ → Waste $\alpha_6, \beta_6, \gamma_6$

Circular Economy



Benefits

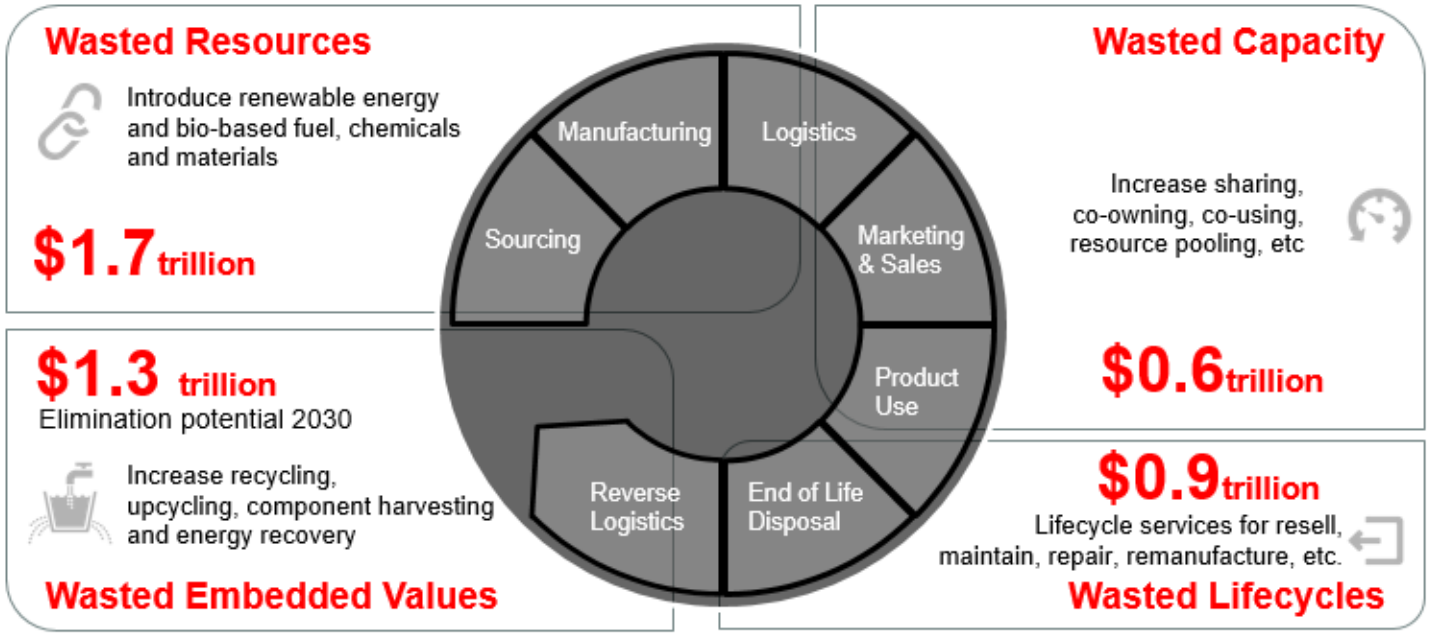
1. Efficiency in Cycle
2. Extended Life including 2nd (Refurbishment) & 3rd (Remanufacturing)
3. Green Supply Chain
4. Efficiency of Product Use

Improvement $\alpha - \Delta$, $\beta - \Delta$, $\gamma - \Delta$

Legend

- α = Resource Required
- β = Environmental Damage
- γ = Waste
- Δ = Reuse , recycle

Benefits of Circular Economy - India

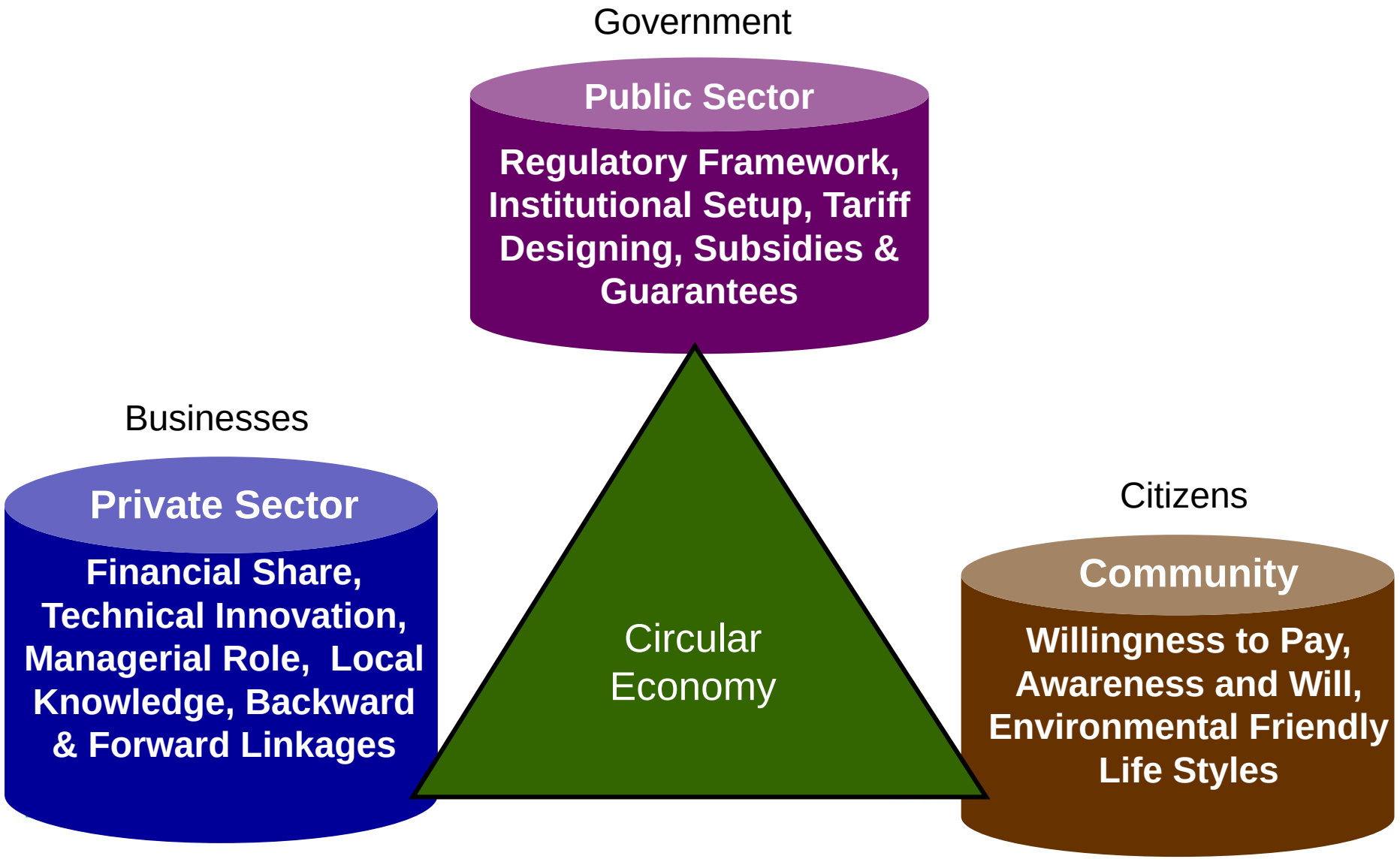


- **Wasted resources** are materials and energy that cannot be continually regenerated, but instead are consumed and forever gone when used.
- Products with **wasted lifecycles** have artificially short working lives or are disposed of even if there is still demand for them from other users.
- Product with **wasted capacity** sit idle unnecessarily; for instance, cars typically sit unused for 90% of their lives.
- **Wasted embedded values** are components, materials, and energy that are not recovered from disposed products and put back into use.

Creating Enabling Environment

- To bring member states on common “definitions” and “understanding” for all the aspects of waste management chain covering all the waste streams
- To assist member states in identification of gaps and solutions for sound waste management focusing on SMM
- To build regional and national capacity on legislative framework and financing mechanisms for supporting trade and investments across countries or within countries in waste management services and technologies
- Assist in developing B2B (business to business), B2C (business to consumer) and B2G (Business to Government) partnerships leading to build effective and efficient waste management service sector

UNEP support to Stakeholders

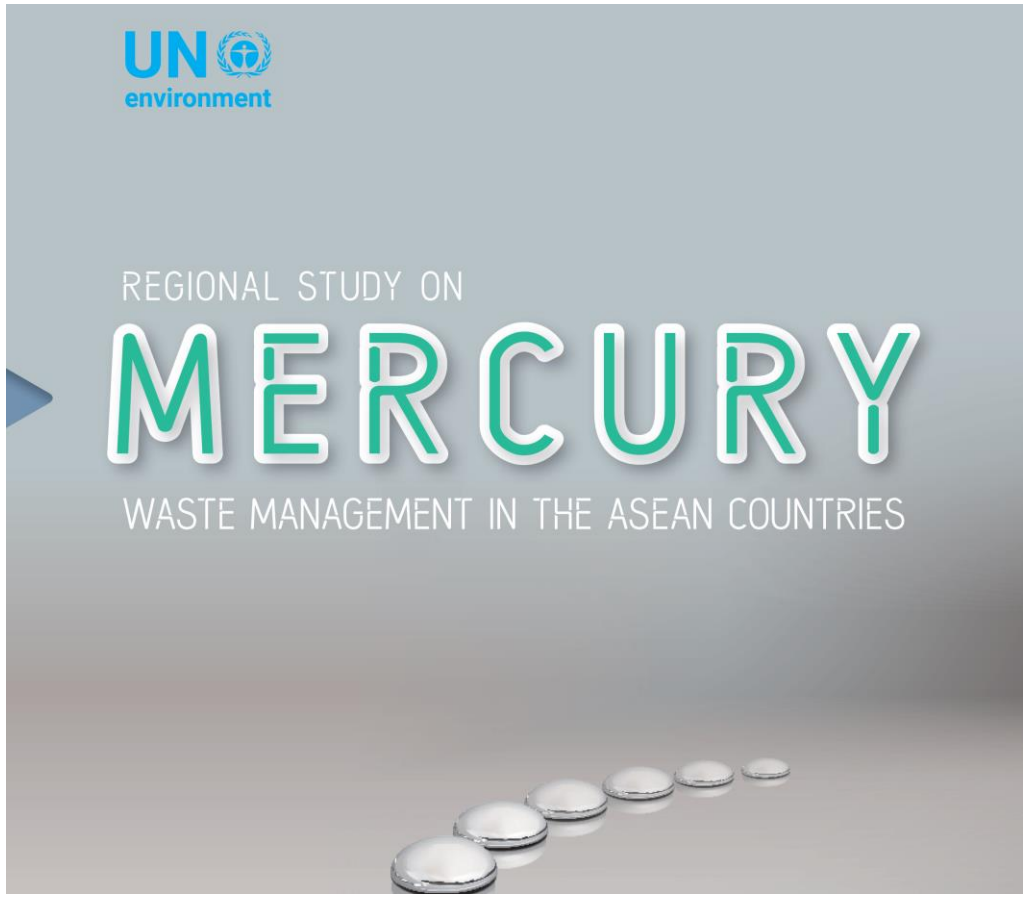


UNEP's toolkits and training

- Guidelines for Holistic Waste Management at national and city level
- Guidelines for Framework Legislation for Integrated Solid Waste Management
- Sustainability Assessment of Technologies
- Waste agricultural biomass to a resource
- Converting waste plastics into a resource
- Technologies for waste oils
- Treatment/Destruction of healthcare waste
- WEEE/e-waste management
- Waste and climate change
- Wastewater reuse
- Water use efficiency – every drop counts

- Quantification and characterisation of waste
- Assessment of current waste management system and gaps therein
- Target setting and stakeholders' concerns
- How to develop integrated solid waste management plan
- Sustainable Public Procurement (Green Public Procurement)
- Compendium of Technologies
- Assessment of waste plastics
- Assessment of E-waste
- Assessment of value chain for E-waste management and take-back system

UNEP STUDIES ON WASTE MANAGEMENT IN ASEAN



EU-FUNDED SWITCH-ASIA RPAC

Policy Advocacy Component

To strengthen the dialogue at regional, sub-regional and national policies on Sustainable Consumption and Production in selected Asian countries, thereby contributing to green growth and reduction of poverty in these countries.

Activity areas

- Advocacy of SCP-related regulatory framework at regional, sub-regional and national fora.
- Demonstration of SCP policy instruments.
- Support the uptake and reporting of SDG 12 and related SDG targets across the 2030 Agenda.

switchasia REGIONAL POLICY ADVOCACY

Funded by the European Union

Implemented by

UN environment programme

Thank you

Mushtaq Ahmed Memon, Ph.D
Regional Coordinator Resource Efficiency
Project Manager, SWITCH-Asia RPAC (EU funded)
UN Environment - Asia and the Pacific Office
memon@un.org