Resource Use Indicators - towards Strengthening 3R Knowledge Base in Asia-Pacific
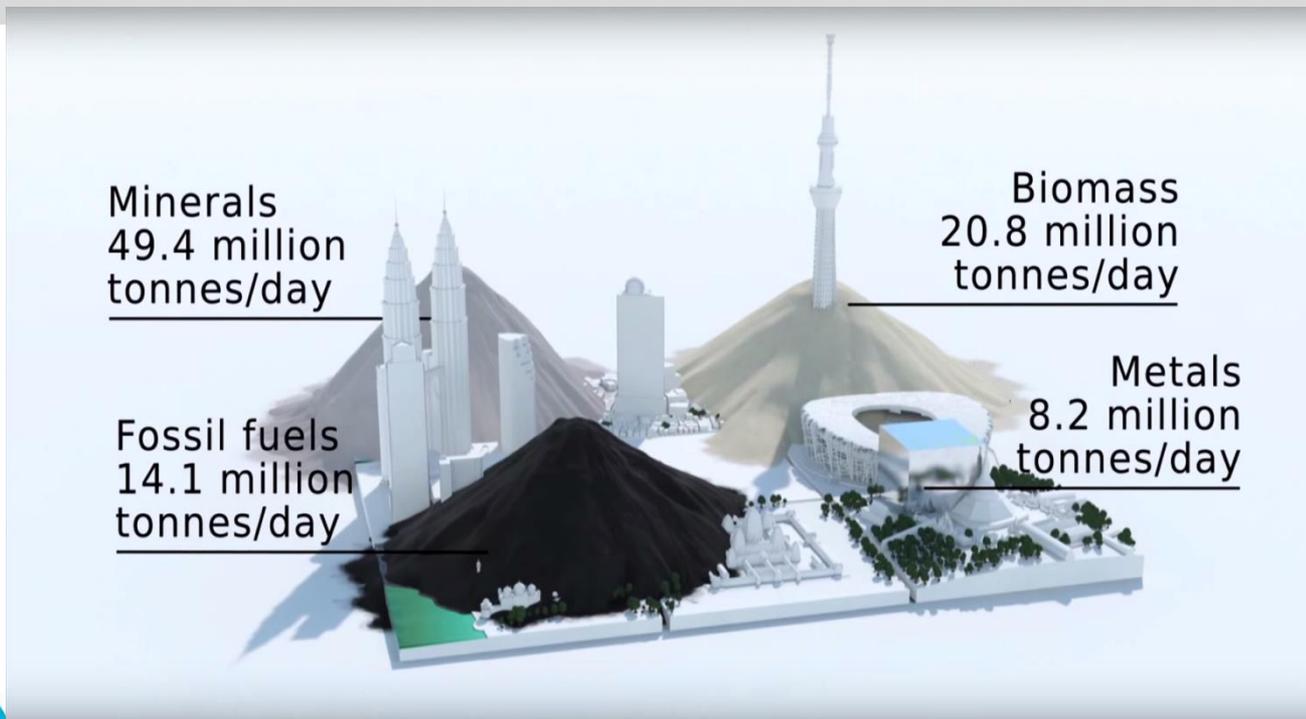
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Resource Use Indicators - towards Strengthening 3R Knowledge Base in Asia-Pacific

Minerals
49.4 million
tonnes/day

Biomass
20.8 million
tonnes/day

Fossil fuels
14.1 million
tonnes/day

Metals
8.2 million
tonnes/day

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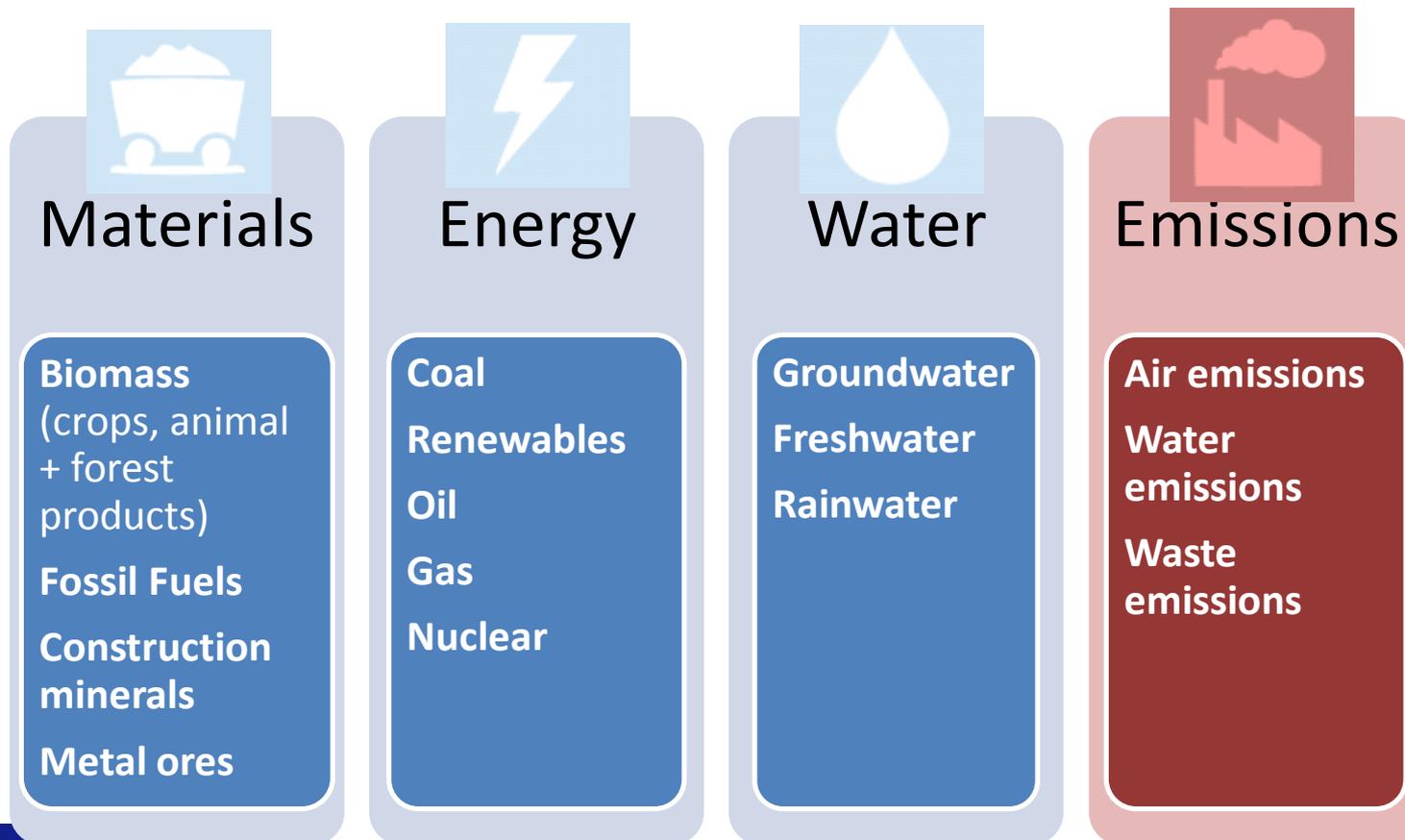The leading global environment authority that sets the global environmental agenda.

Mission: "To provide leadership and encourage partnership in caring for the environment by **inspiring**, **informing**, and **enabling** nations and peoples to improve their quality of life without compromising that of future generations."

- Climate change,
- Disasters and conflict,
- Ecosystems management,
- Environmental governance,
- Harmful substances and hazardous waste,
- Resource efficiency – sustainable consumption and production
- Environment under review

What are natural resources?

Natural resources are the physical basis of our social and economic activities.

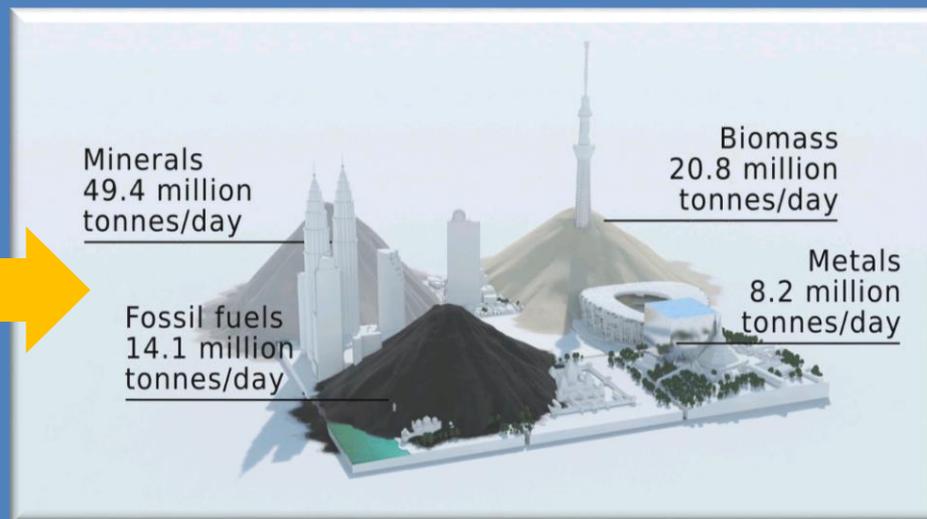| Materials	Energy	Water	Emissions
Biomass (crops, animal + forest products)	**Coal**	**Groundwater**	**Air emissions**
Fossil Fuels	**Renewables**	**Freshwater**	**Water emissions**
Construction minerals	**Oil**	**Rainwater**	**Waste emissions**
Metal ores	**Gas**		
	Nuclear		

*Land is another resource, but is not in scope of our report

What are natural resources?

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Materials **Energy** **Water** **Emissions**

Minerals 49.4 million tonnes/day

Biomass 20.8 million tonnes/day

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Fossil fuels 14.1 million tonnes/day

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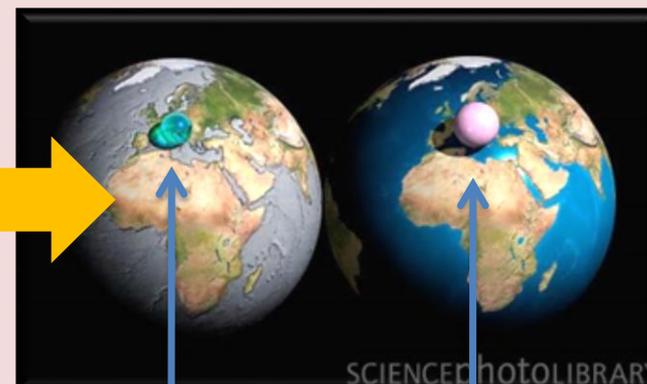| Materials | Energy | Water | Emissions |

Hydrosphere

Atmosphere

*Land is another resource, but is not in scope of our report

Global environmental agenda in resource use

1st FORUM OF
MINISTERS & ENVIRONMENT
AUTHORITIES OF ASIA PACIFIC
19 - 20 May 2015, Bangkok

Priorities for Asia Pacific:

- Address climate change and enhance resilience
- **Decouple economic growth from resource use and pollution**
- Maintain biodiversity and sustainable provision of ecosystem services
- Manage Chemicals and Waste
- Use the Sustainable Development Goals to scale up environmental action
- Environment and Health, especially Air Quality
- Science-Policy Linkages

Global environmental agenda in resource use

Sustainable Development Goals

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

8.4 improve progressively through 2030 global **resource efficiency** in consumption and production, and endeavour to decouple economic growth from environmental degradation...

Goal 12. Ensure sustainable consumption and production patterns

12.2 by 2030 achieve sustainable management and efficient use of **natural resources**

Global environmental agenda in resource use

But how do we get there?

Indicators for Resource Efficiency

- Inform about issues and trends

- Help agenda setting

- Informed public debate

- Underpin policy goals and policy statements in the form of targets

- Measure progress in achieving policy objectives

Indicators for a Resource Efficient Green Asia Pacific

Natural Resource Use

Trade Dependency

Resource Productivity

Eco-efficiency of Production

Consumption

Adjusted Resource Productivity

Economic Growth and Human Development

#1 - Natural Resource Use

What is it?
Total amount of natural resource use and natural resource use per capita

Policy Use?
Evidence base for decoupling policies.
Show the physical scale of the economy.

Indicators?
Domestic Material Consumption (tonnes)
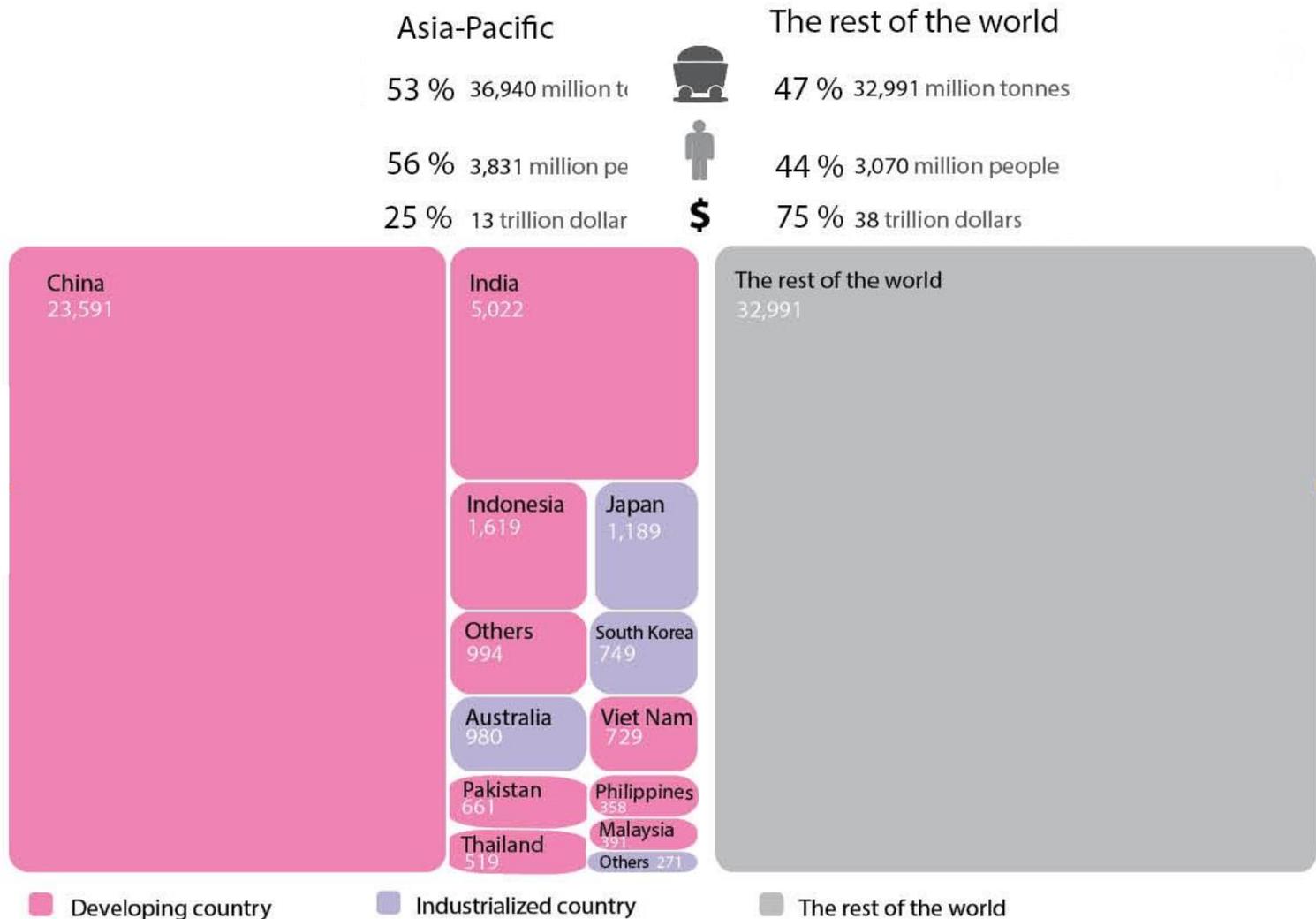Total Primary Energy Supply (joule)
Total Water Use (m^3)
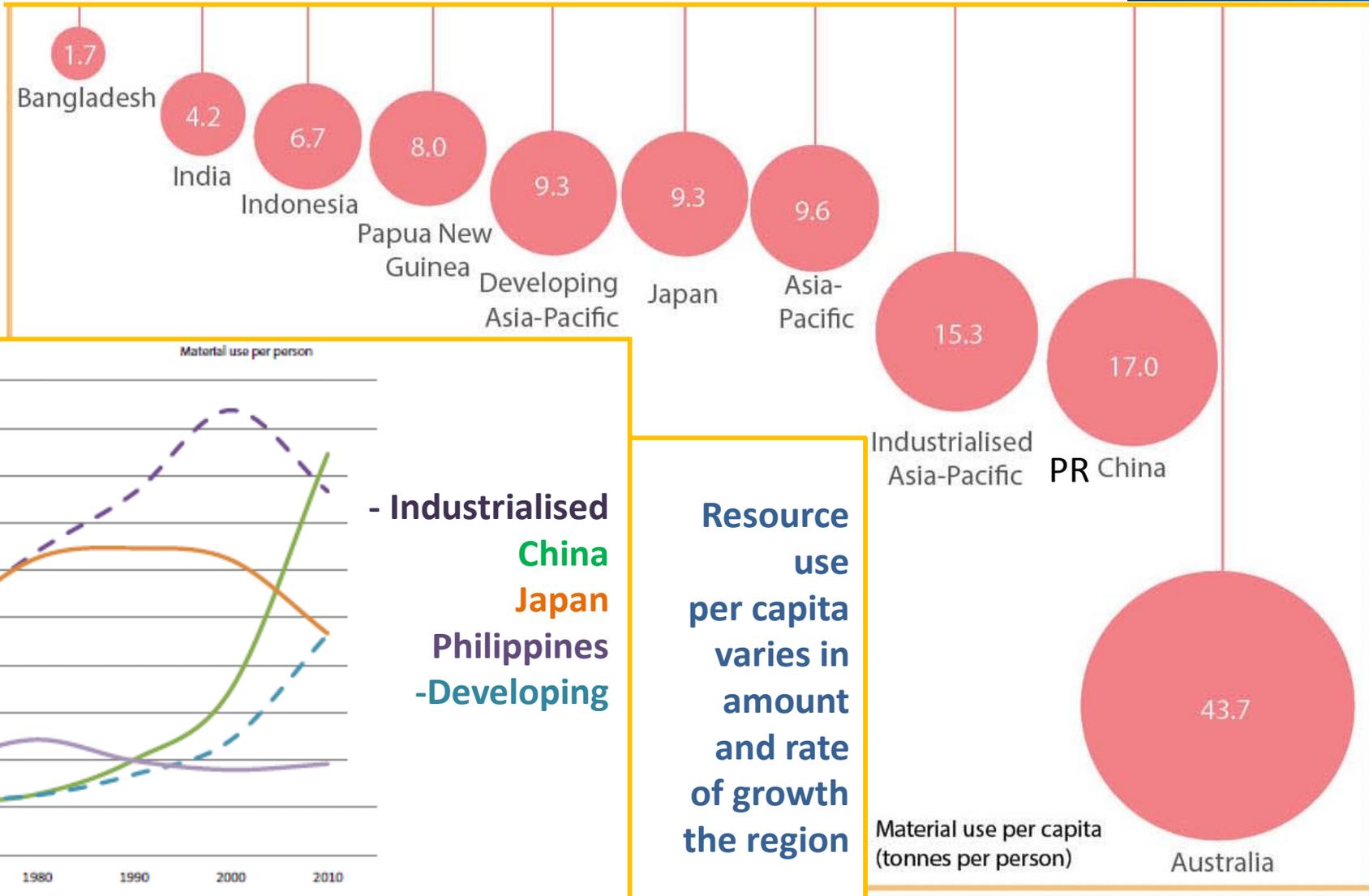Greenhouse Gas Emissions (tonnes)

#1 - Natural Resource Use

Asia-Pacific

	The rest of the world
53 % 36,940 million t	47 % 32,991 million tonnes
56 % 3,831 million pe	44 % 3,070 million people
25 % 13 trillion dollar	75 % 38 trillion dollars

Year 2010
Material use
Unit: million tonnes

China 23,591
India 5,022
Indonesia 1,619
Japan 1,189
Others 994
South Korea 749
Australia 980
Viet Nam 729
Pakistan 661
Philippines 358
Malaysia 391
Thailand 519
Others 271
The rest of the world 32,991

Developing country   Industrialized country   The rest of the world

#1 - Natural Resource Use

1.7 Bangladesh

4.2 India

6.7 Indonesia

8.0 Papua New Guinea

9.3 Developing Asia-Pacific

9.3 Japan

9.6 Asia-Pacific

15.3 Industrialised Asia-Pacific

17.0 PR China

43.7 Australia

Material use per person

- Industrialised
China
Japan
Philippines
-Developing

Resource use per capita varies in amount and rate of growth the region

Material use per capita (tonnes per person)

#2 - Trade Dependency

What is it?
Dependence on natural resources from global markets.

Policy Use?
Importers: tracking resource efficiency to reduce economic dependency from trade
Exporters: mitigating negative side effects of a trade based primary resource economy to allow for better distribution and use of primary resource incomes
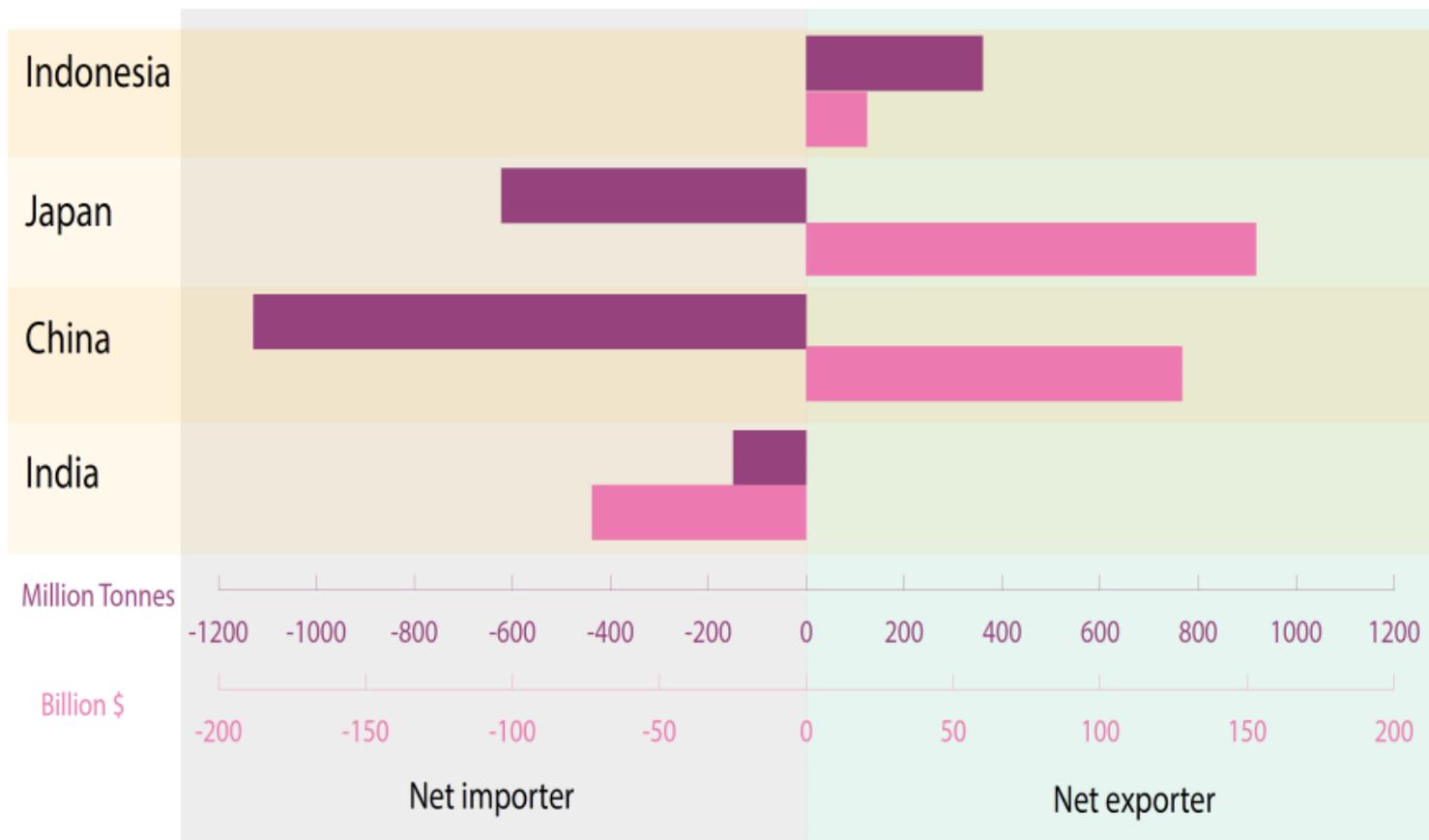
Indicators?
Physical Trade Balance (tonnes)
Unit Price of Trade ($/kg)
Imports/Exports (tonnes)

#2 - Trade Dependency

Physical trade balance year 2010
Economic trade balance year 2010

	Million Tonnes	Billion $
Indonesia		
Japan		
China		
India		

Million Tonnes: -1200, -1000, -800, -600, -400, -200, 0, 200, 400, 600, 800, 1000, 1200

Billion $: -200, -150, -100, -50, 0, 50, 100, 150, 200

Net importer | Net exporter

#3 - Resource Productivity

What is it?
Economic output per unit of natural resource input

Policy Use?
Important for developing countries increasing their resource base to support human development and material standards of living. This becomes particularly important when Asian economies depend more on natural resource imports and global resource prices are rising.
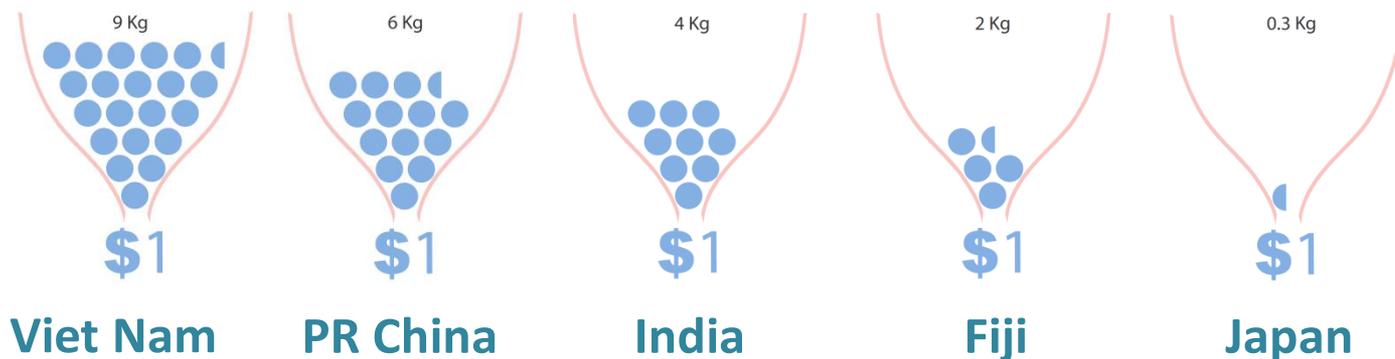
Indicators?
Material Productivity ($/kg)
Energy Productivity ($/joule)
Water Productivity ($/m3)
GHG Intensity ($/kg)

#3 - Resource Productivity

Material use per dollar of GDP

| Viet Nam | PR China | India | Fiji | Japan |

Material Intensities for Asia-Pacific and World groupings

- Asia Pacific Developing
- Asia Pacific Industrial
- Rest of World
- World
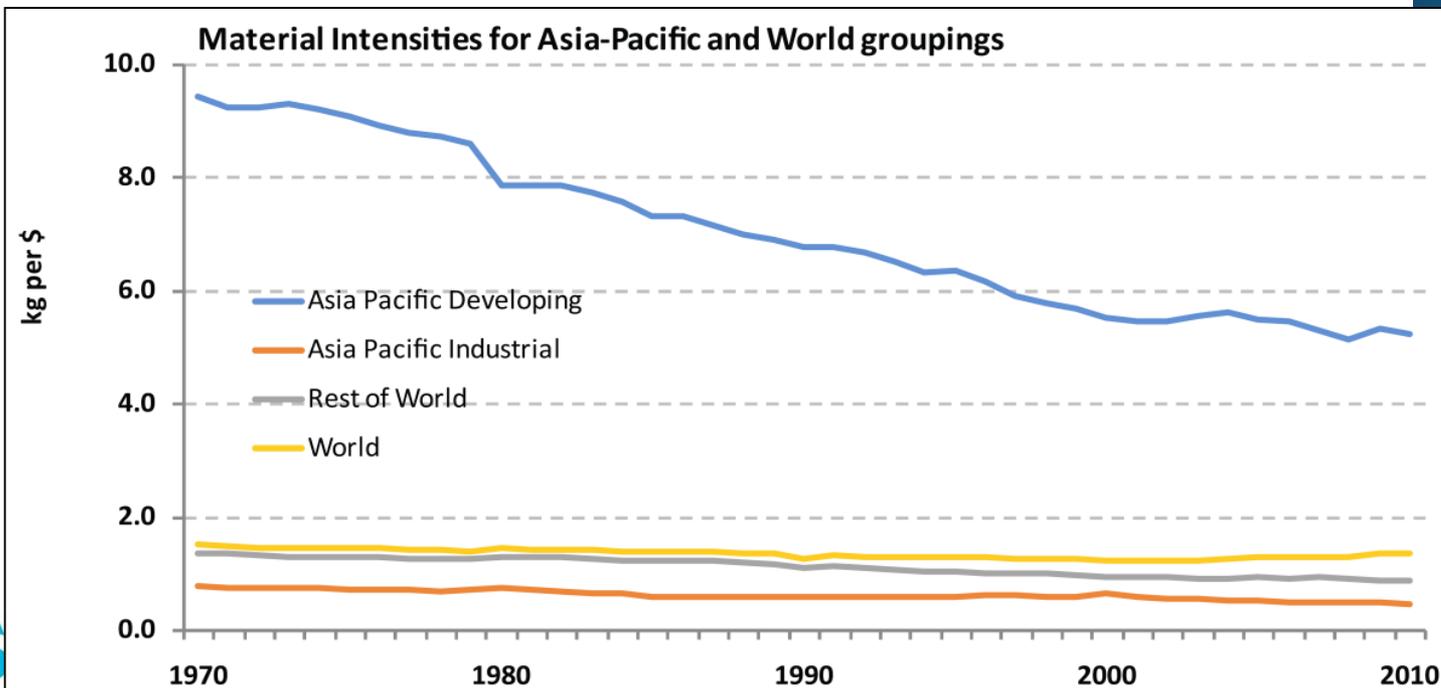
#4 - Eco-Efficiency of Production

What is it?
Total sectoral resource use, and sectoral resource productivity

Policy Use?
Allows setting targets and establishing policies for different economic activities and will have a much greater steering effect than national targets would have. Because they are close to the activities they would drive innovation and best practice in economic sectors.

Indicators?
Water Use in Agriculture (m3)
Emissions of the Energy Sector (tonnes)
Material Use for Manufacturing (tonnes)
Material Use for Construction (tonnes)
Emissions of Transport (tonnes)
Material Footprint of Services (tonnes)

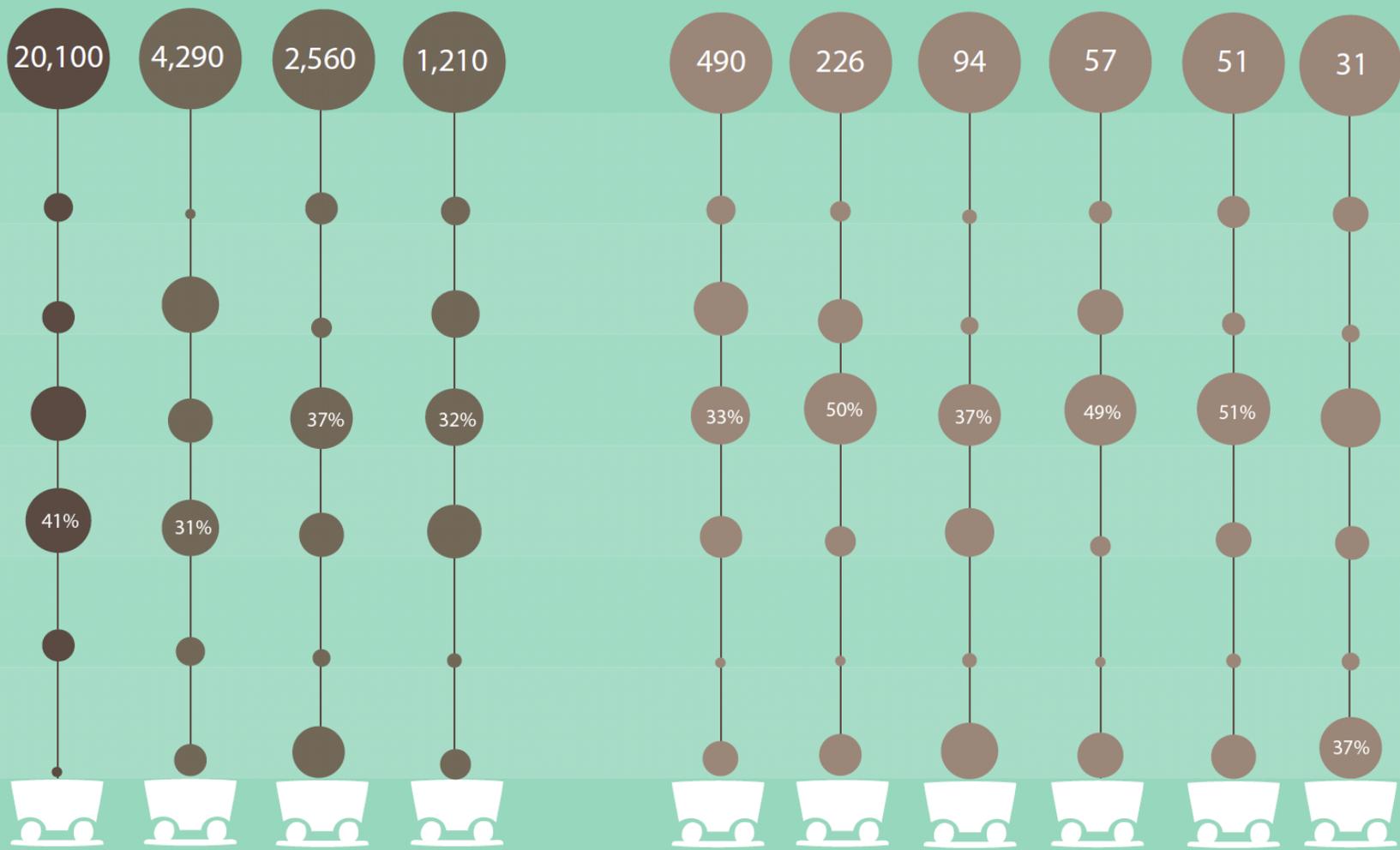# Share (%) of different sectors of the country's **material** footprint

Total material footprint
Units: Million tonnes

- < 1,000
- 1,000 - 10,000
- >10,000

	China	India	Japan	Indonesia		Malaysia	Bangladesh	New Zealand	Nepal	Sri Lanka	Lao PDR
Total	20,100	4,290	2,560	1,210		490	226	94	57	51	31

Sectors (top to bottom):
- Mining and energy
- Agriculture
- Manufacturing
- Construction
- Transport
- Services

Manufacturing: Japan 37%, Indonesia 32%, Malaysia 33%, Bangladesh 50%, New Zealand 37%, Nepal 49%, Sri Lanka 51%

Construction: China 41%, India 31%

Services: Lao PDR 37%

	China	India	Japan	Indonesia		Malaysia	Bangladesh	New Zealand	Nepal	Sri Lanka	Lao PDR
Material footprint per person (Unit: tonnes per person)	14.5	3.6	20.1	5.0		17.3	1.5	21.5	2.1	2.5	4.8
Material footprint intensity (Unit: kilograms per dollar)	5.2	3.4	0.6	3.2		2.7	2.6	0.8	5.6	1.5	7.7

#5 - Consumption

What is it?
Natural Resource Footprint.
Attribution of natural resource
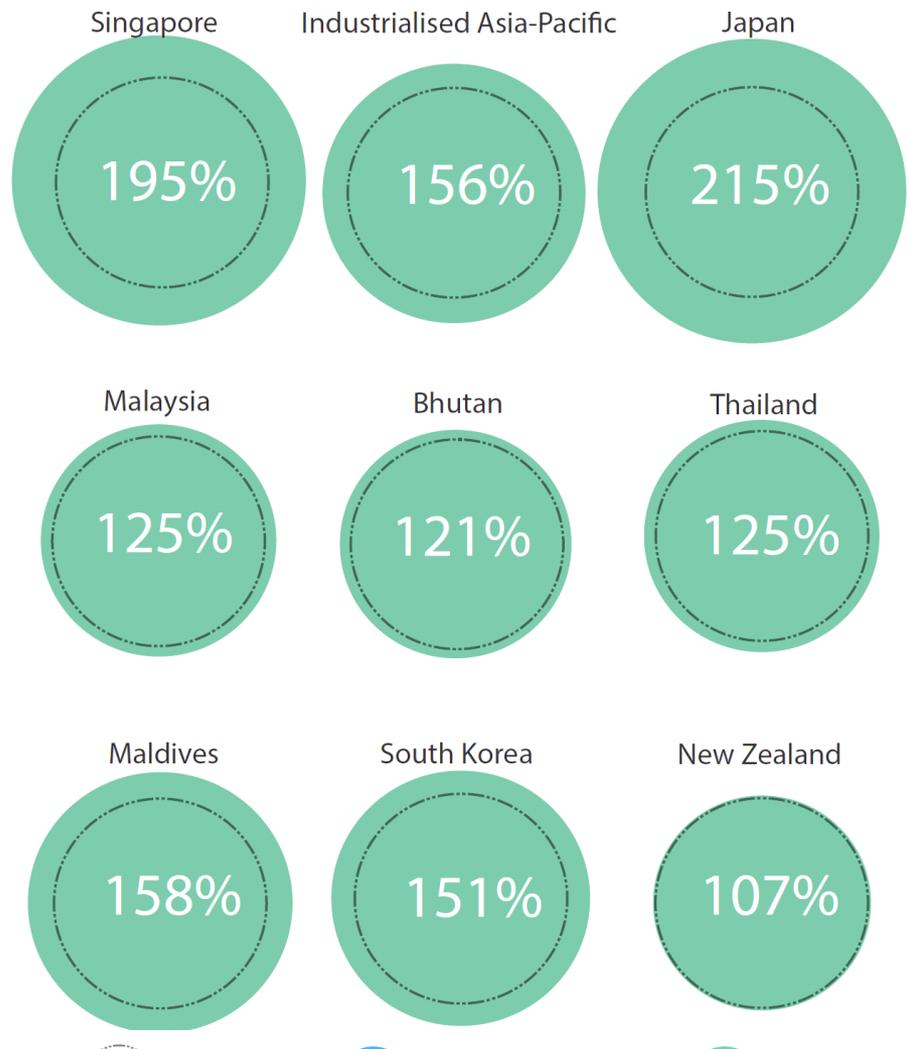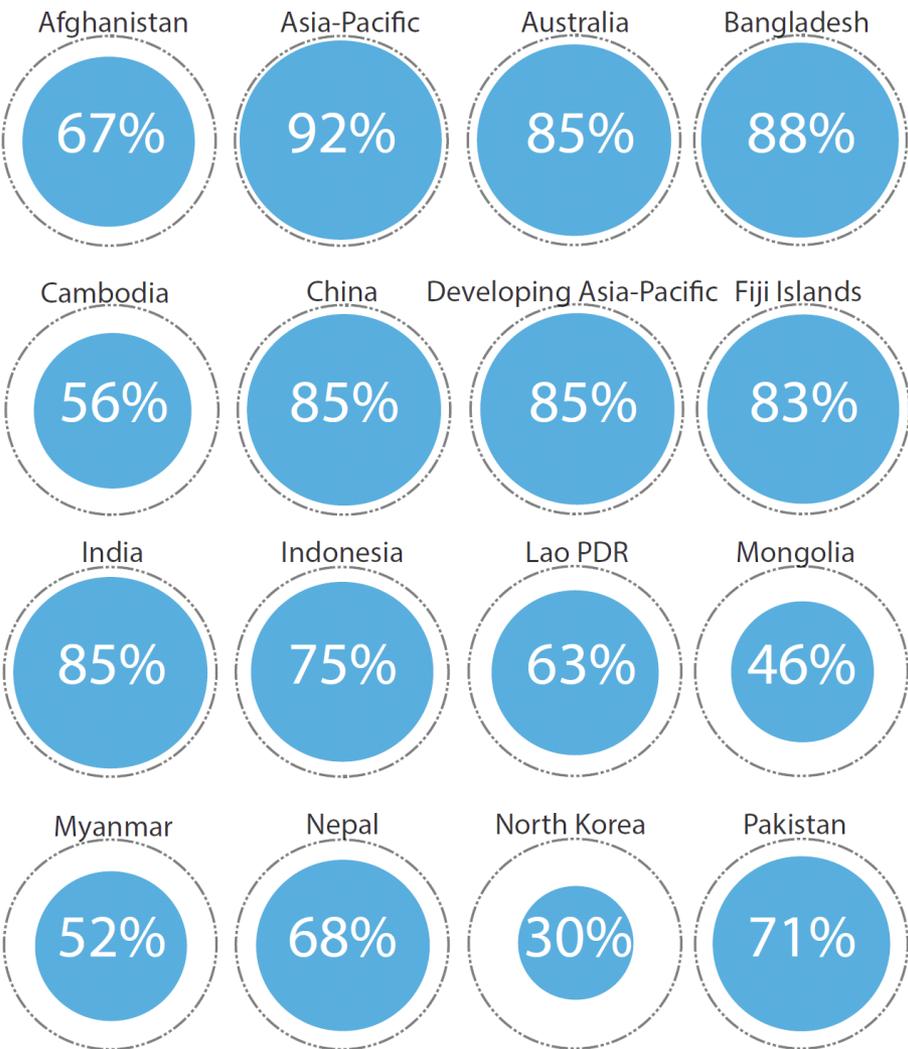use to final consumption.

Policy Use?
It 'corrects' for upstream requirements of imports and exports. For high importing and exporting countries this will allow an 'equal playing field' regardless of economic structure and role in the global economy.
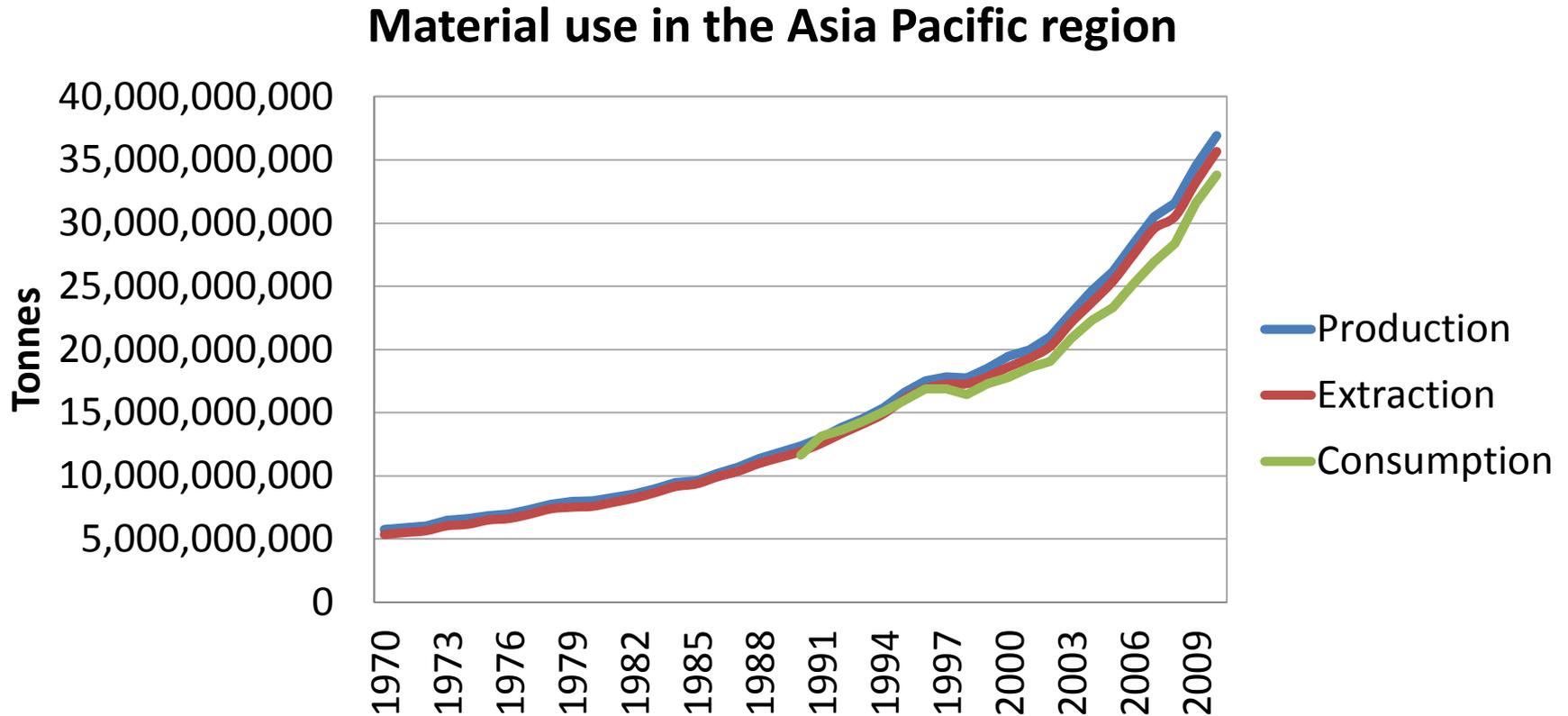
Indicators?
Material Footprint (tonnes)
Energy Footprint (joule)
Water Footprint (m3)
Carbon (GHG) Footprint (tonnes)

#5 - Consumption

Afghanistan 67%	Asia-Pacific 92%	Australia 85%	Bangladesh 88%
Cambodia 56%	China 85%	Developing Asia-Pacific 85%	Fiji Islands 83%
India 85%	Indonesia 75%	Lao PDR 63%	Mongolia 46%
Myanmar 52%	Nepal 68%	North Korea 30%	Pakistan 71%

Singapore 195%	Industrialised Asia-Pacific 156%	Japan 215%
Malaysia 125%	Bhutan 121%	Thailand 125%
Maldives 158%	South Korea 151%	New Zealand 107%

Material use   Material Footprint < Material use   Material Footprint > Material use

Resource use in Asia-Pacific

Material use in the Asia Pacific region

Production: Domestic Material Consumption (imports + extraction – exports)

Consumption: Material Footprint

Extraction: Mining, Agriculture

Communicating is important!

More information:

http://www.unep.org/AsiaPacificIndicators

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