Evolving 3R Policies and Trends in Asia and the Pacific ~ A snapshot from Tokyo 3R Forum (2009) to Surabaya 3R Forum (2014)

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Environmental Management Centre, India

environmental management centre LLP
emc™

Contents

Presentation in brief

1. Challenges –APAC and SIDS
2. Why 3R?
3. The Response
4. 3R Forum and Way Ahead

1.

APAC and SIDS

Situation analysis of the APAC and SIDS

APAC

Labor-intensive export-oriented

Largest resource extractor since 1980s

17of the 28 megacities

Since 1990 until 2014, a billion more have been added

SIDS

Tourism focused

1/3rd of APAC countries are SIDS

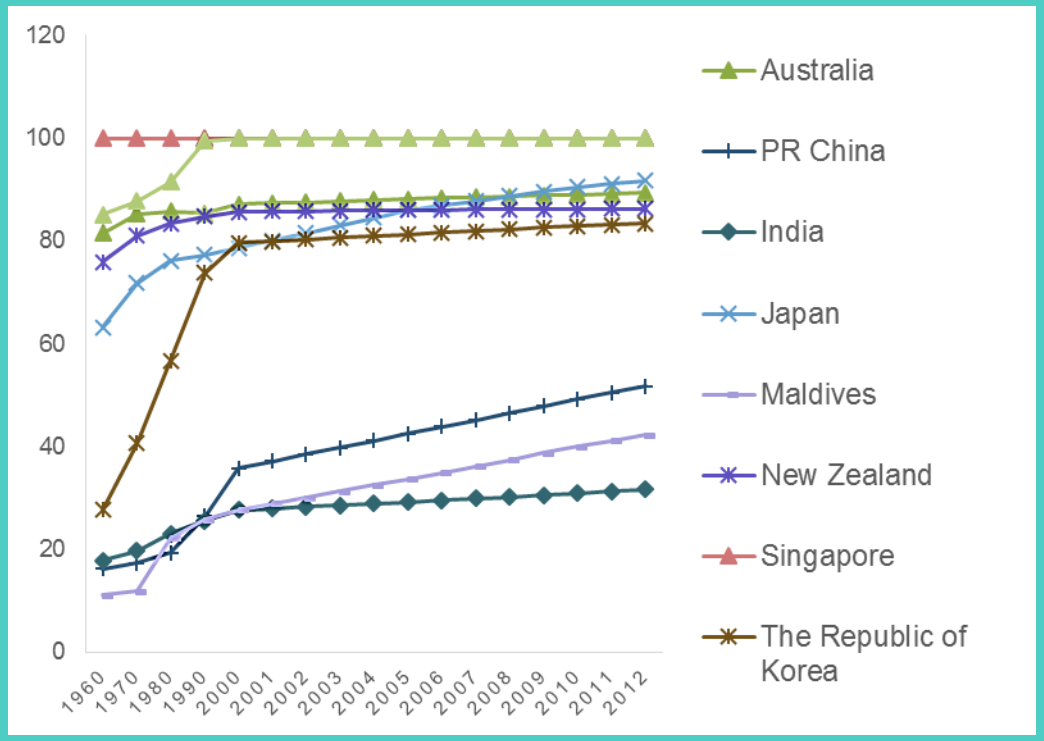
Sea level rise, water scarcity, natural disasters

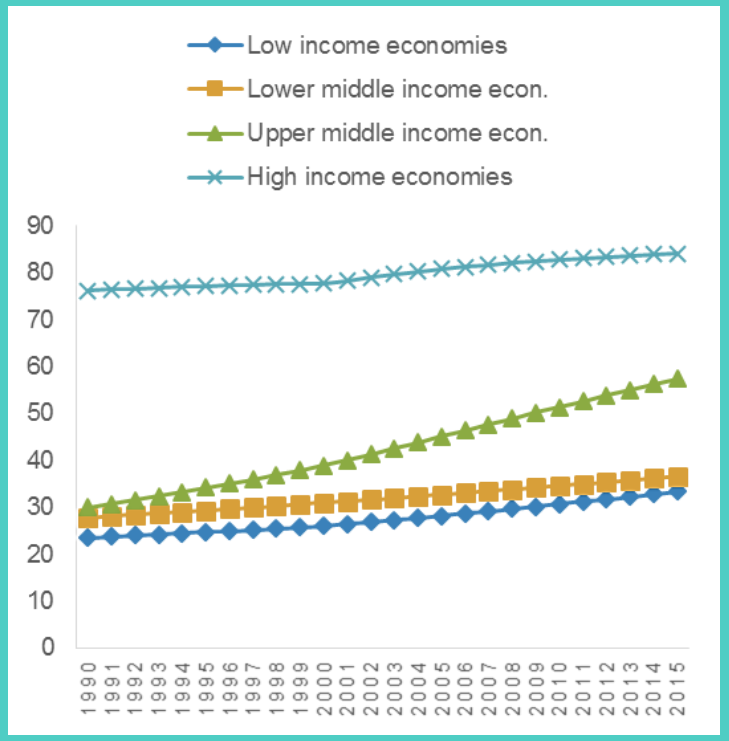
Economy depends on Fisheries, aquaculture

Rising waste generation, marine debris

UNEP (2015), Indicators for a Resource Efficient and Green Asia and the Pacific - Measuring progress of sustainable consumption and production, green economy and resource efficiency policies in the Asia-Pacific region

PR China, India, Maldives are going through rapid urbanization

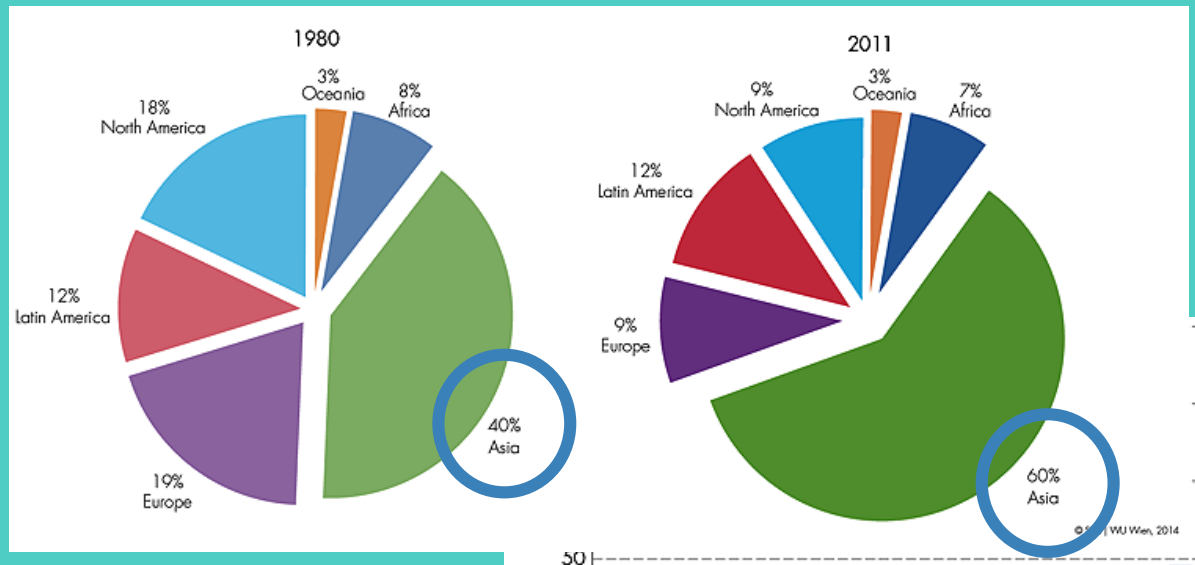


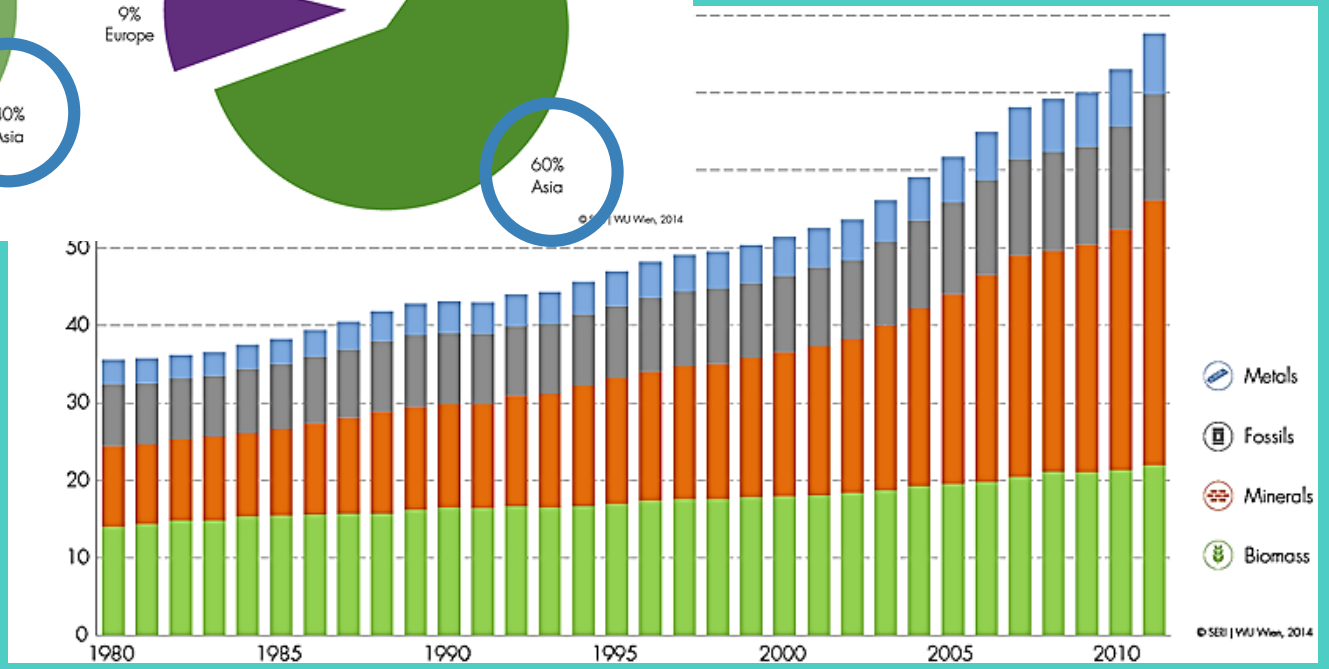


Urbanization trends

Nations prosper, lifestyles change and consumption increases

EMC Database using UNESCAP data





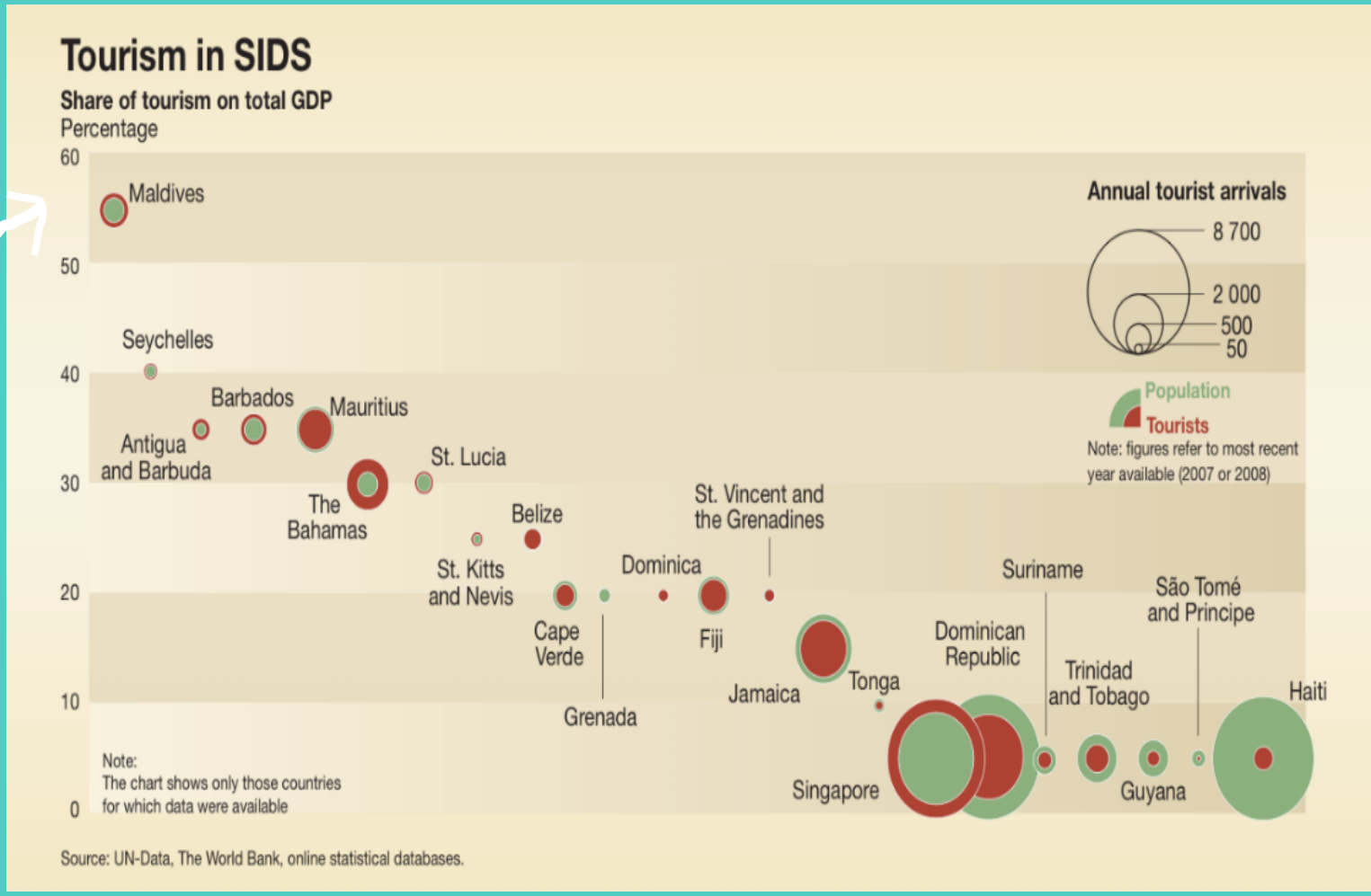
Asia consumes even more

Resource extraction

Material consumption for APAC - 5.7 to 37 billion tonnes per year between 1970 and 2010

SERI Global Material Flow Database

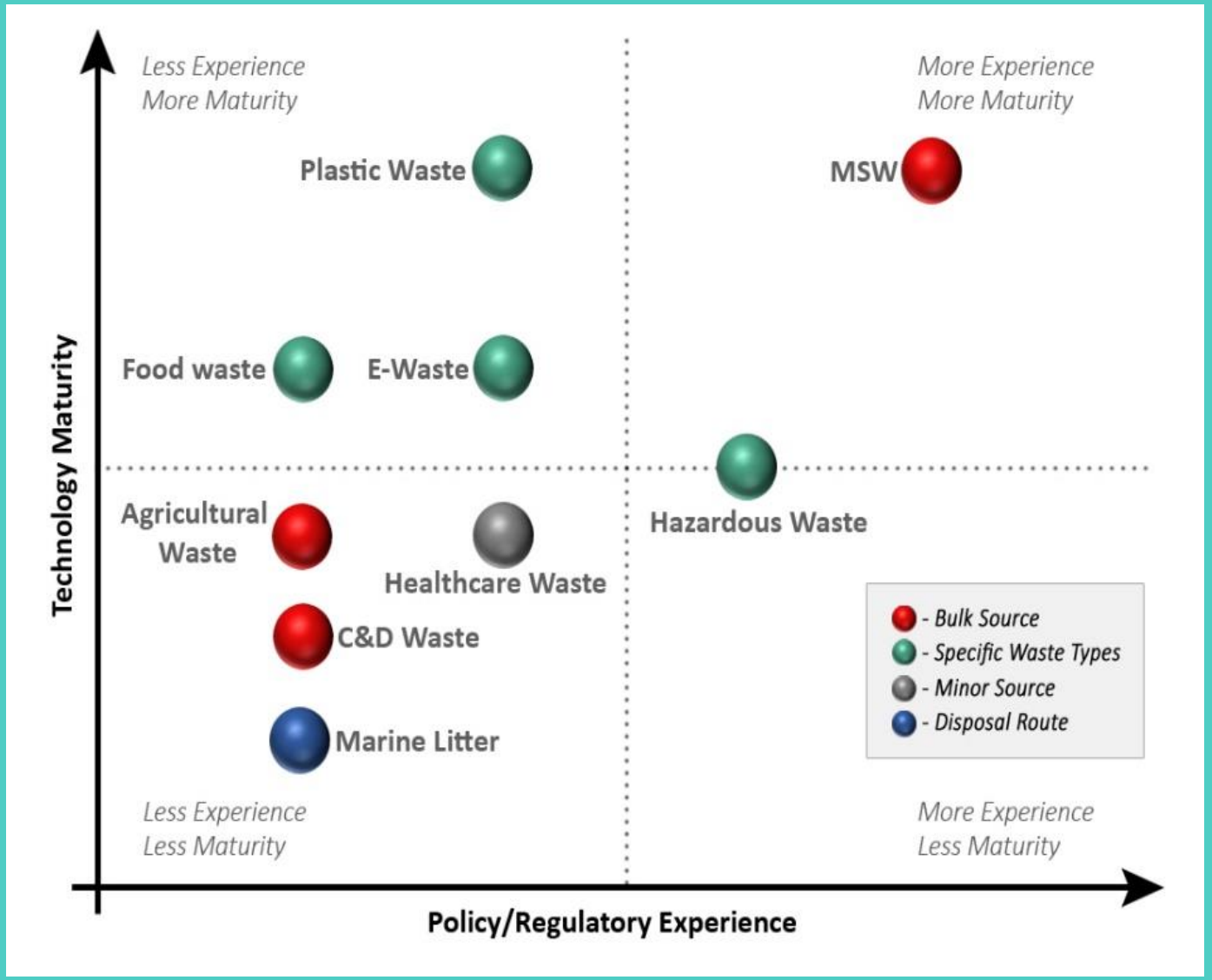
Tourist receipts represent more than 30% of SIDS' total exports



Tourism

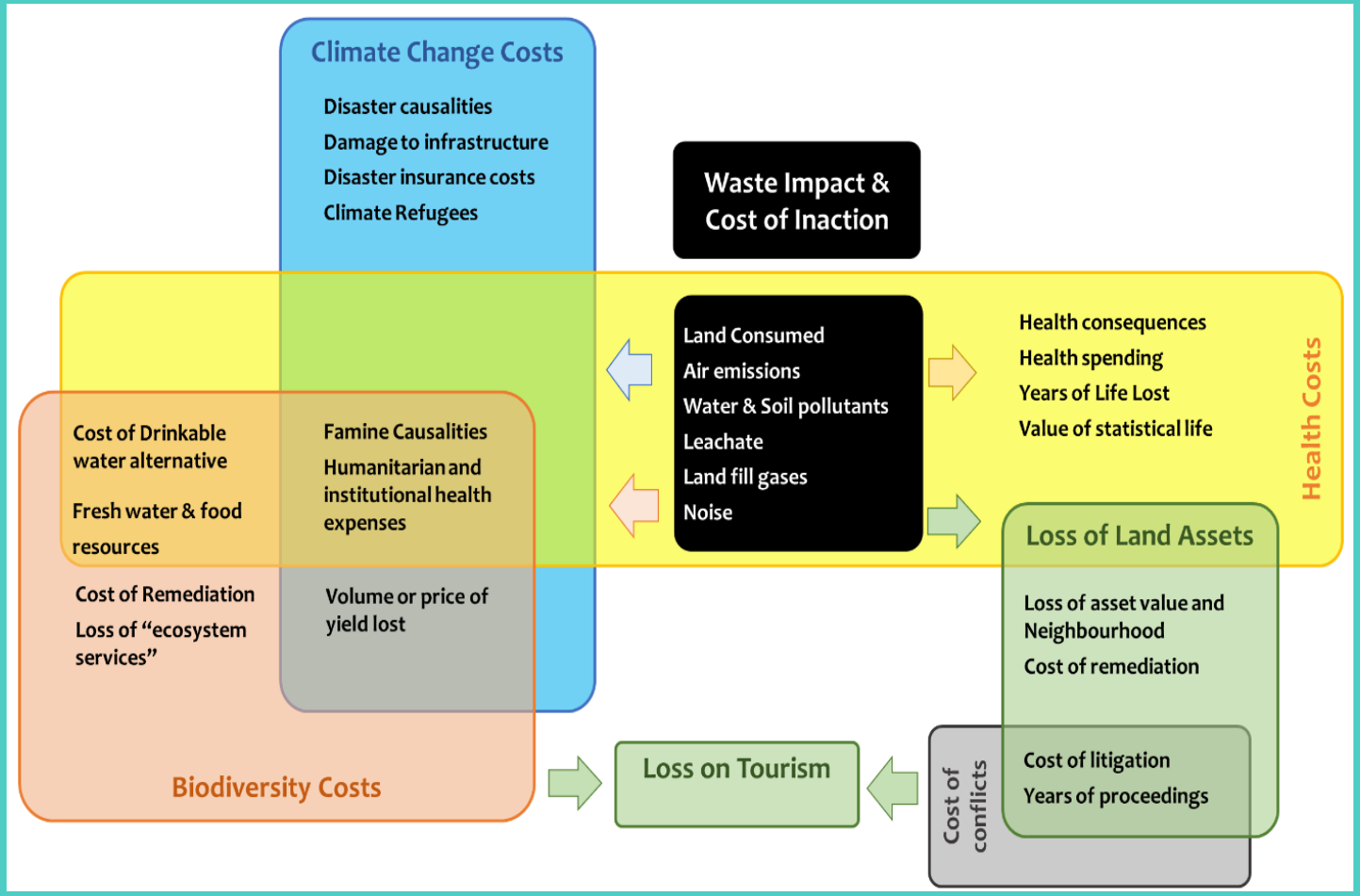
GRID-Arendal (2013), SIDS-FOCUSED Green Economy: An Analysis of Challenges and Opportunities

Waste Streams - Risks and Volumes



Technology and Policy Maturity

In Asia 50-70% of revenues are spent on waste management and the cost of inaction eats away 5% of the GDP



Cost of inaction

Impacts on human health and the ecosystems can be avoided if waste is perceived as a resource and 3Rs are introduced

Challenges

- Resource scarcity
- Land paucity
- Population rise
- Threatened biodiversity
- Natural disasters
- Climate change
- High dependence on Fossil Fuels

2.

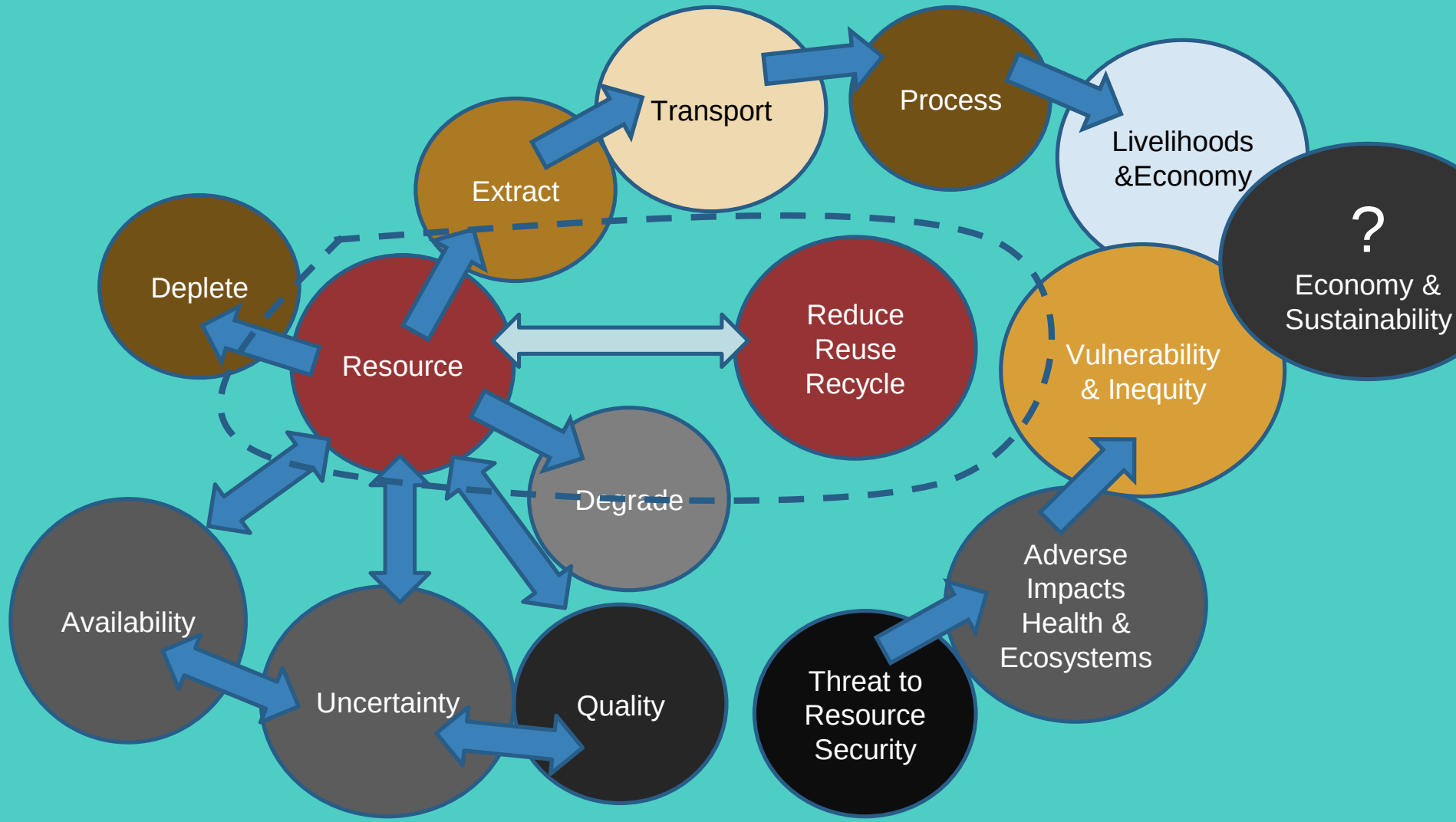
Why 3R?

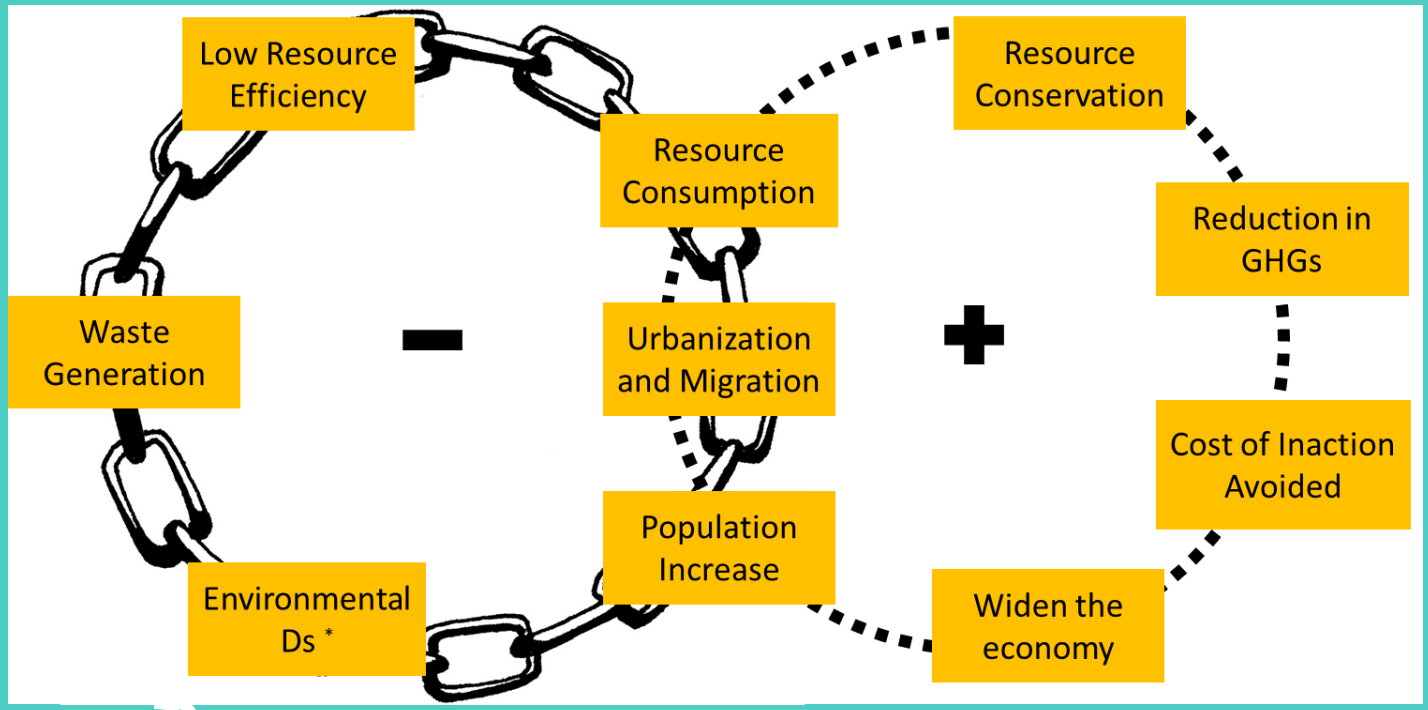
Rethinking

Innovating

Looking for alternate solutions

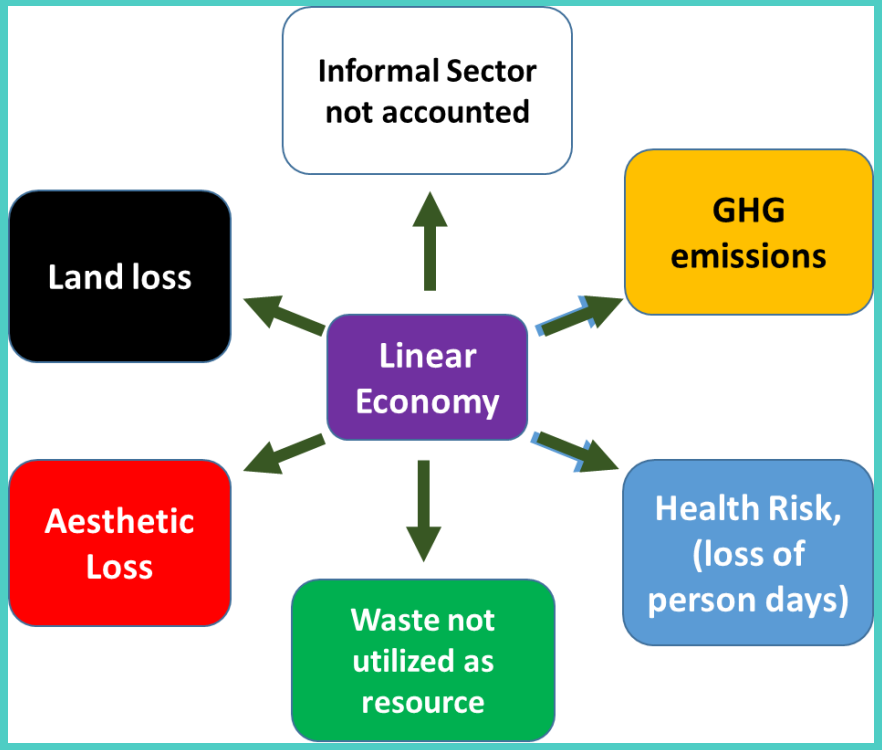
3Rs in Global Economy & Sustainability

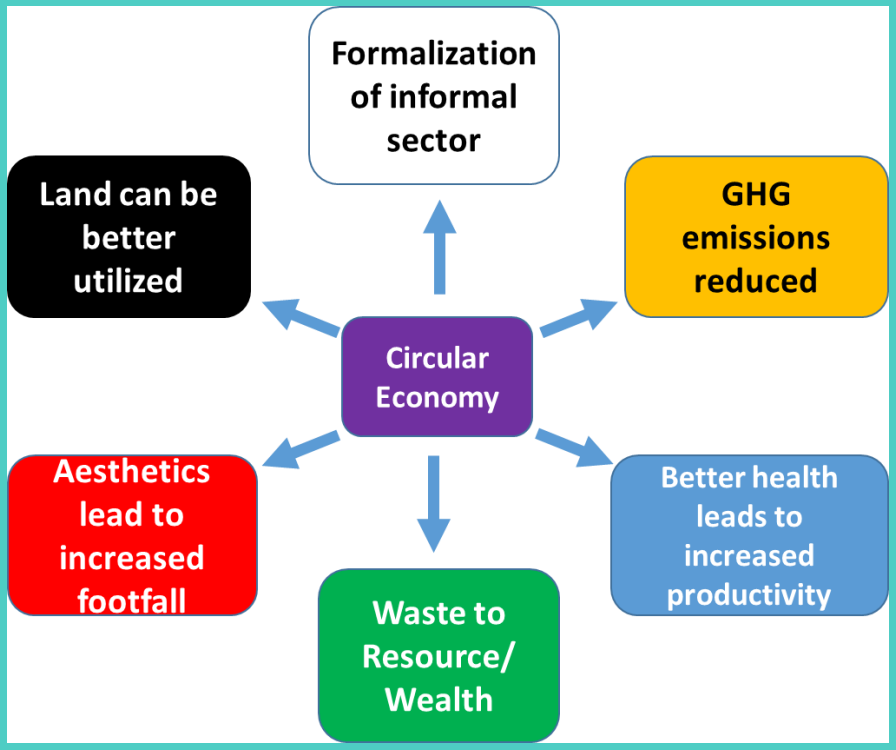




* Depletion, Degradation, Deterioration, Deforestation, Desertification

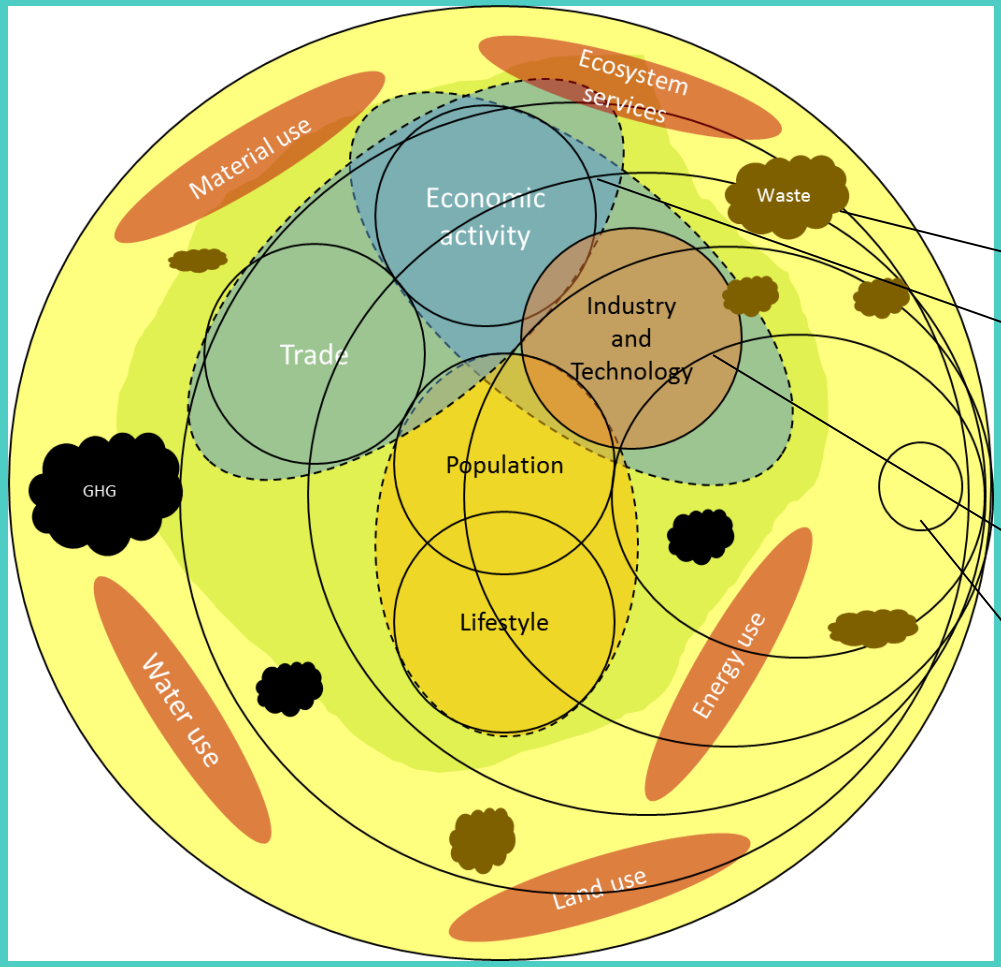
Moving from Negative Loop to Positive





Linear to Circular Economy

Investment of only 2% of global GDP required in greening certain central sectors of the economy



High level policy goals SDGs

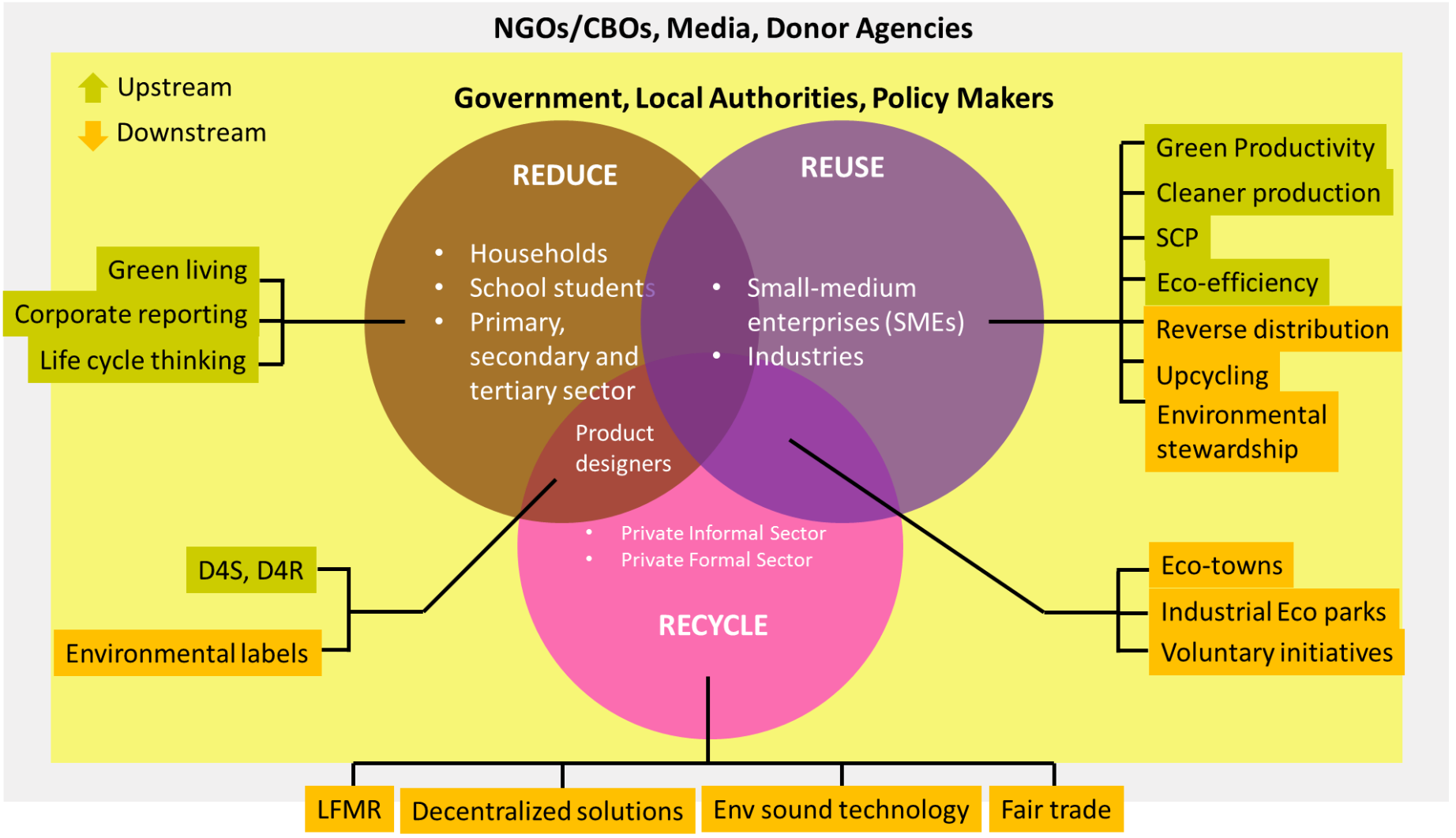
Green Economy

SMC, circular economy

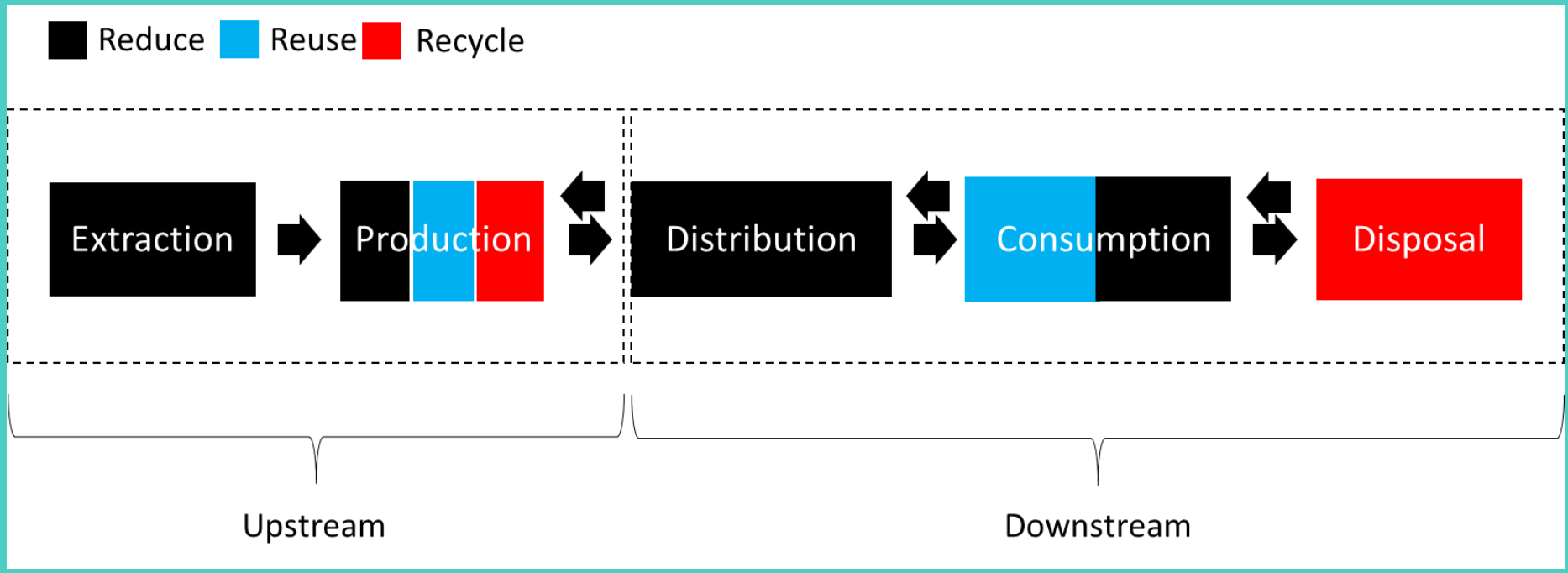
3R

Ripple effect of 3R

Image depicts a petri dish

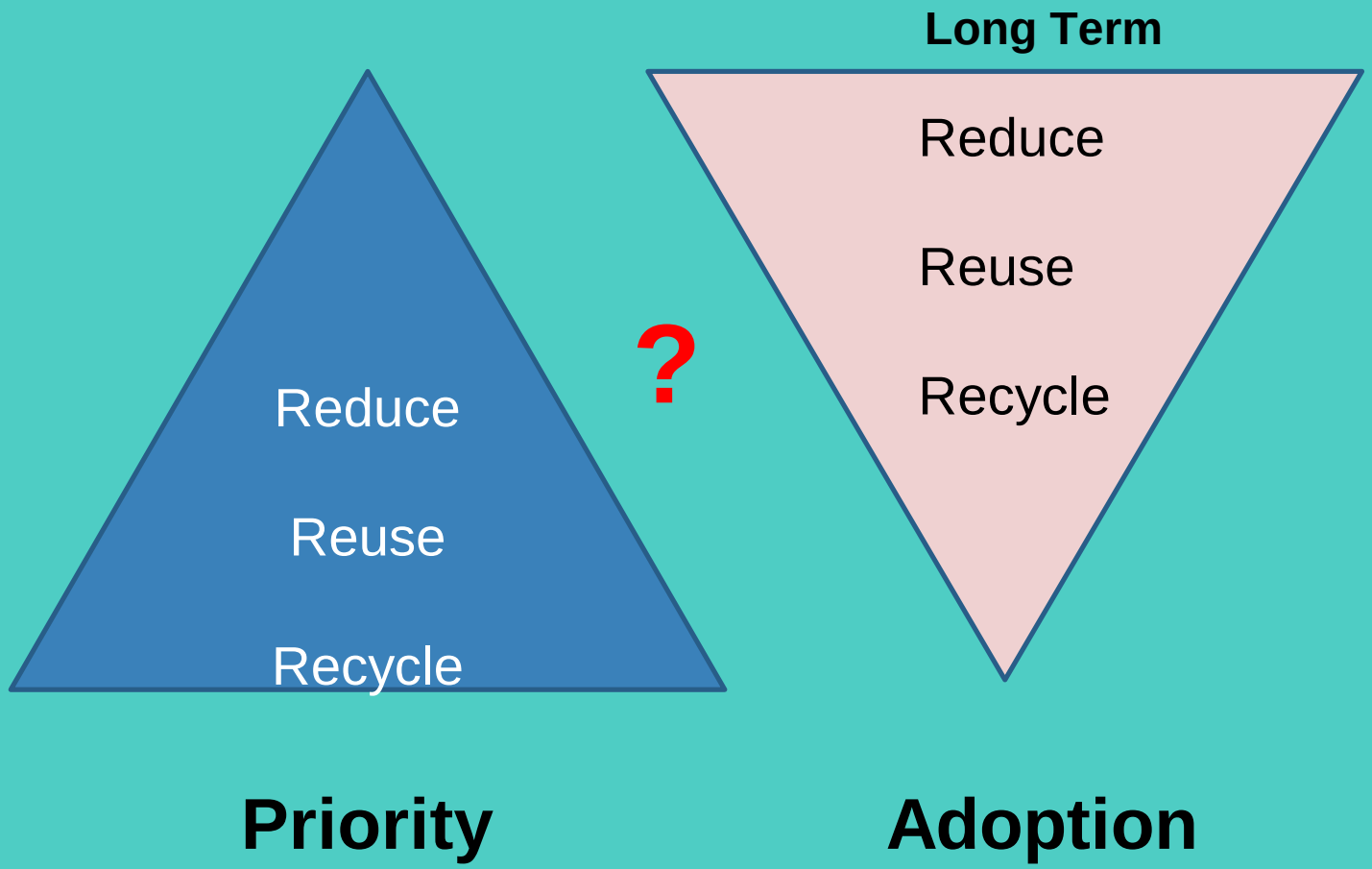


Multiple Dimensions, Perspectives & Eco-system of Stakeholders



3R across value chain

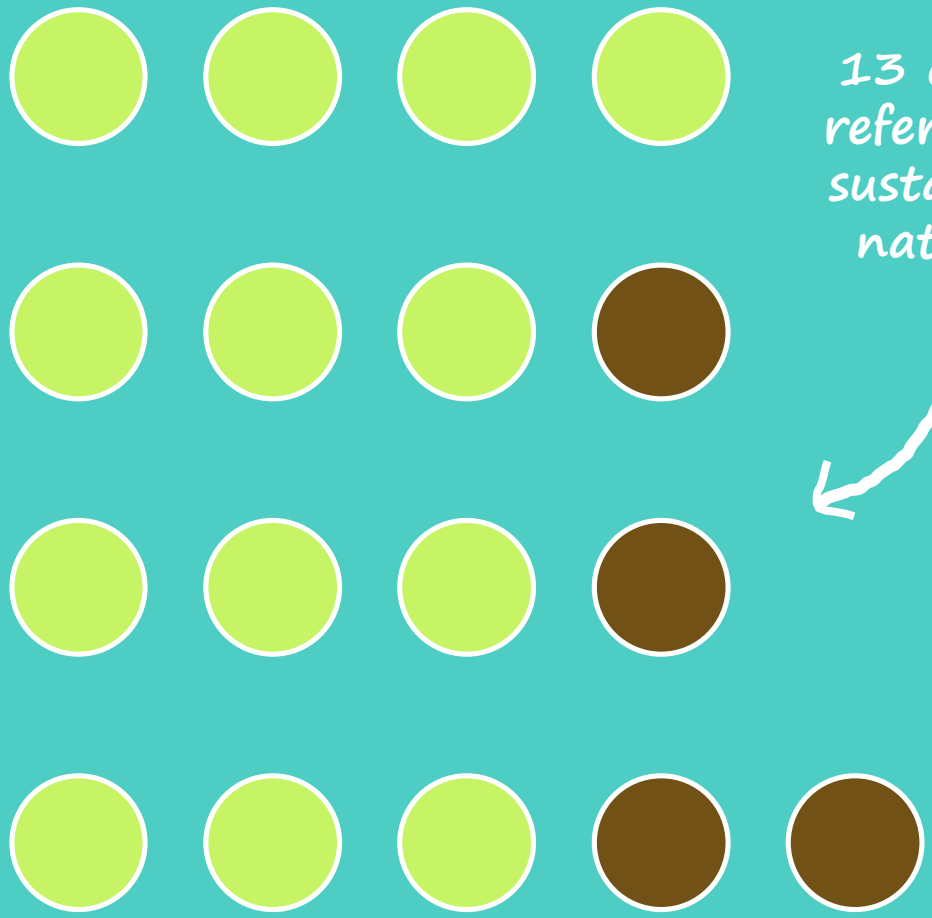
More awareness and action needed on Reduce


Reduce
Reuse
Recycle
?
Long Term
Reduce
Reuse
Recycle
Priority
Adoption

3.

The Response

Response to challenges faced



13 of the 17 goals refer to the need to sustainably manage natural resources

SDGs

UNEP (2015), Indicators for a Resource Efficient and Green Asia and the Pacific - Measuring progress of sustainable consumption and production, green economy and resource efficiency policies in the Asia-Pacific region

Can we tame our consumption and urbanization?

http://smart-lab.ru/uploads/images/00/11/22/2013/01/22/6edc0f.jpg

Sustainable Consumption & Production

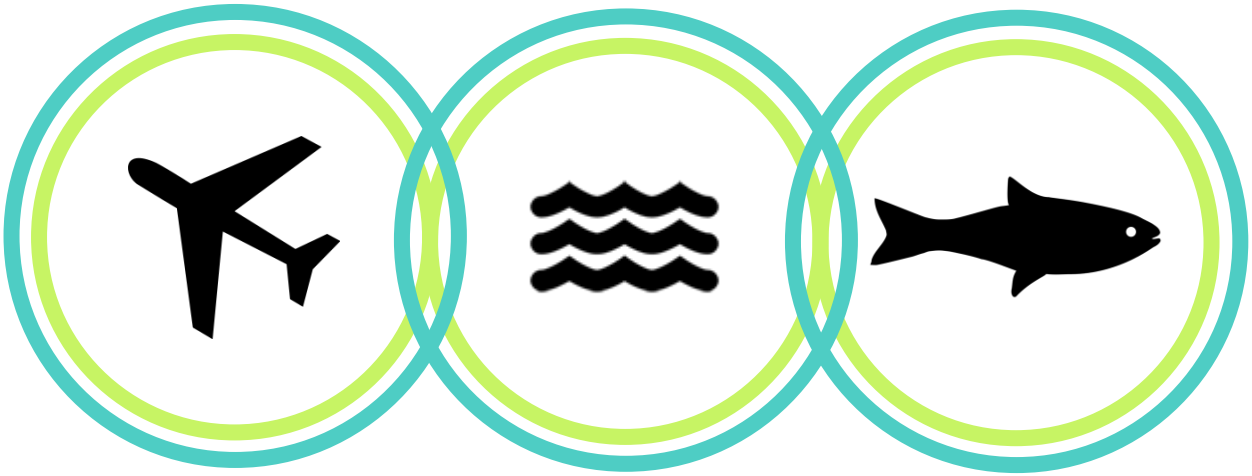
Economic instruments	Regulatory instruments	Informational instruments	Cooperation instruments
• Environmental taxes • Fees and user charges • Certificate trading • Environmental financing • Green public procurement • Subsidies	• Norms and standards • Environmental liability • Environmental control and enforcement	• Eco-labelling • Sustainability reporting • Information Centres • Consumer advice services • Environmental quality targets and monitoring	• Technology transfer • Voluntary agreements

http://www.apo-tokyo.org/wedo/wp-content/uploads/sites/3/2014/12/4-2-Dr.-Chaiyod-Bunyagidj.pdf

Sustainable Tourism

Contribution of 3R and Resource Efficiency towards Sustainable Tourism Development in SIDS

- Ecotourism affords a renewed hope for these destinations
- Re-branding of a destination for ecotourism



QUANTITATIVE

Material Flow Indicators

Resource productivity

Cyclic use rate

Final disposal amount

Supplementary Material Flow Indicators

Resource productivity excluding earth and rock resources input

Coordination with efforts toward Low-carbon Society

QUALITATIVE

Indicators to monitor changes

Resource productivity of fossil resources

Biomass resources input rate

Total Material Requirement (TMR) including hidden flows

Indicators based on international resource cycles

Resource productivity by industry area

Indicators and Quantitative Targets
Establishment of an SMC Society, JAPAN

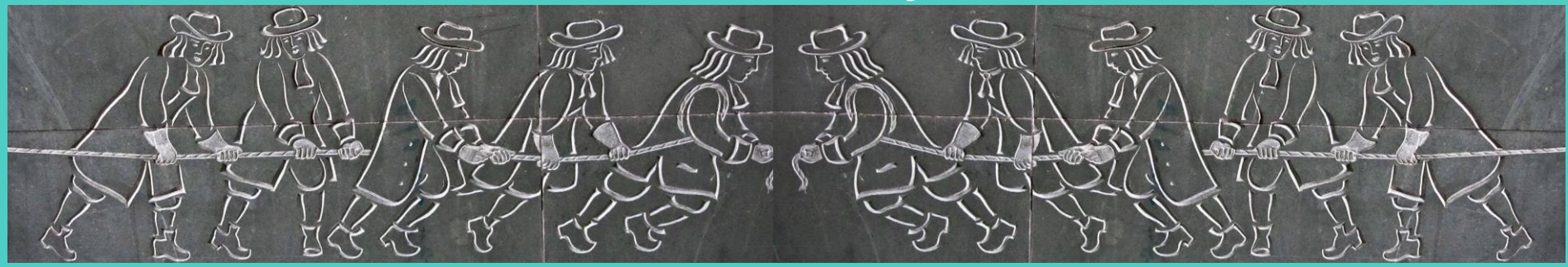
http://www.env.go.jp/en/recycle/smcs/2nd-f_plan.pdf

Planning, Space, Concessions, Incentives, Institutional support

Government/ULBs

Industry

Informal sector



Integrated business models

Microenterprises, Cooperatives, and Public-private Partnerships

https://www.flickr.com/photos/garryknight/5589129130/

Mumbai	30,000+	$650 million–1 billion a year
Buenos Aires	40,000+	$178 million a year
Jakarta	37,000	$50 million a year

Informal sector economics

Economic impacts

http://www.ppiaf.org/sites/ppiaf.org/files/publication/Gridlines-44-Informal%20Recycling%20-%20MMedina.pdf

Wongpanit Business Model, Thailand

1. Cooperating with local governments in promoting recyclable waste separation at source for sale

2. Providing capacity building services to various stakeholders: residents, communities, governments, investors

3. Extension and scaling up the business through a franchise system that can distribute income for wider stakeholders under the concept of a ‘win-win business model’

https://prasadmodakblog.files.wordpress.com/2014/08/final_report_recycling_business_final-july28-2014.pdf

Partnerships in Waste to Resource Management

APAC	Global
• Aloha+ Challenge: A Culture of Sustainability – He Nohona ʻAeʻoia • Bringing Biogas to Samoa • Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (J-PRISM) • Pacific Waste Solutions • Samoa Solid Waste Management (SWM) Partnership • Sustainable Consumption and Production for SIDS Initiative (within the 10YFP) • The UK/Samoa Biogas project • Travel Foundation, The (formerly The Sustainable Tourism Initiative) • University Consortium of Small Island States (UCSIS) • Waigani Convention • Waste Management and Sanitation Improvement (WMI) Programme • Zero Hunger Challenge (ZHC)	• Global Partnership for Oceans • Global Partnership on Waste Management (GPWM) • Global Partnership on Marine Litter (GPML), also functioning as one of the thematic areas under GPWM • **International Partnership for Expanding Waste Management Services of Local Authorities (IPLA) by UNCRD**

Economic Instruments (EIs) vs. Command and Control Strategies (CACs)

EIs have at least 6 benefits over CACs

- Provide flexibility in the overall cost of reducing emissions
- Act as incentives for the use of innovative abatement technologies
- Allocate environmental and natural resources to parties who value them most
- Guarantee self-enforcement by aligning public and private interests
- Increase transparency in resource use and allocation
- Help in cost-recovery of publicly provided services

PPP

Polluters Pay Principle

OR

Private Public Partnership?

http://www.unep.ch/etb/publications/econinst/kenya.pdf

Financing

Private sector participation (PSP)	Debt – with combination of municipal bonds model
• Can bring in capital and expertise • Focus on operation, not overall responsibility for planning, monitoring etc. • Open, competitive bidding • Clarity on tasks, risks and cost recovery • Various forms of PPP – contracting, concession (BOO, BOT), franchising, open competition/free subscription	• Municipal banks model • Municipal development funds • Pooled financing • Credit enhanced/risk mitigation financing

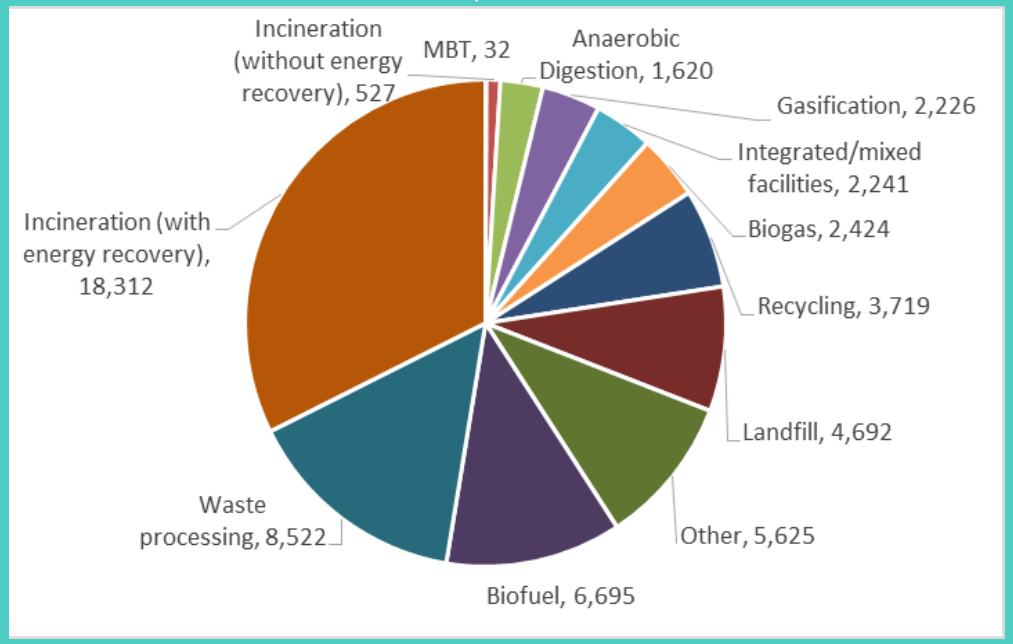
Built based on presentation by Karin Eberle Senior Urban Environmental Engineer, CDIA

Financing

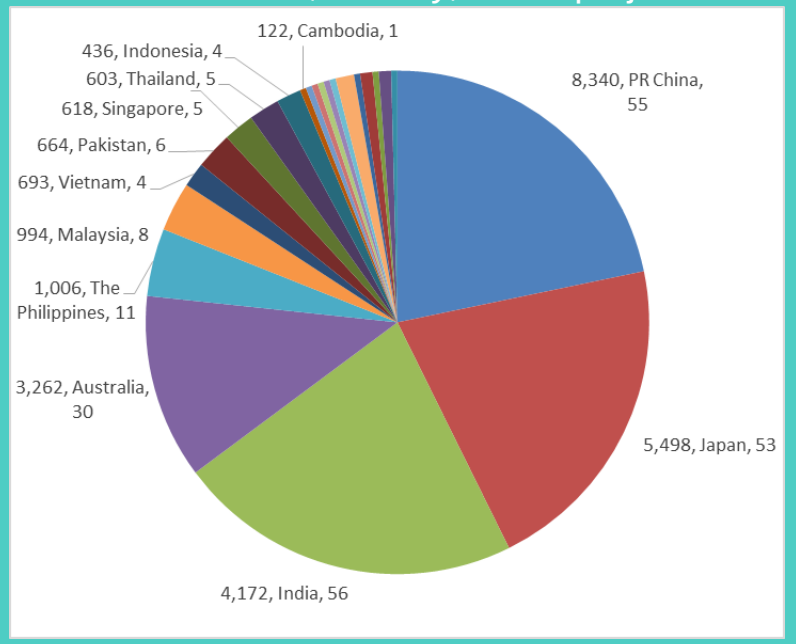
Financing through land use (remediation and control)	Multilateral Banks
Land banking Land remediation for brownfield use	• Long tenor, low interest loans • Specialized funds, usually with sector focus • Urban Financing Partnership Facility (UFPF), ADB • Carbon market program, ADB • Sector focused (e.g. Carbon Market Initiative Funds, Clean Energy Partnership Facility, CC Fund) , ADB • Public Private Infrastructure Advisory Facility (PPIAF), ADB, WB and 15 donors • Sector focused (e.g. Global Environmental Facility, Special CC Fund, Clean Technology Fund)

Built based on presentation by Karin Eberle Senior Urban Environmental Engineer, CDIA

US$ million



US$ million, country, no. of projects



W2R Technologies

Thermal technologies with energy recovery preferred

PR China, Japan, India and Australia have been investing the most

Extracted from AcuComm's Waste Business Finder database. Data covers Jan 2013 to December 2014

Technology gaps?

Policy gaps?

TECHNOLOGY STATUS FOR IMPLEMENTATION OF 3R IN BANGLADESH

Waste Category	Technology	Status
Urban Municipal Waste	Thermal Recovery	O
	Fuel Recovery	O
	Material Recovery	O
	Sorting	○
	Pulverizing	O
	Composting	●
	Incineration	⊙
	Collection	⊙
E-Waste	Material Recovery	⊙
	Sorting	⊙
	Pulverizing	⊙
	Collection	⊙
Healthcare Waste	Material Recovery	⊙
	Sorting	⊙
	Pulverizing	⊙
	Incineration	⊙
	Collection	⊙

● Formal and Strong ⊙ Informal but Weak ☒ Technology Gap
O Formal but weak O Informal and Strong

3R Management Aspects			Status
Systems for Integrating Environmental Considerations into Socio-economic Activities	Framework	National Environmental Policy 1992 National Environmental Management Action Plan (1995-2005)	O
	Direct Regulatory	• The Bangladesh Environment Conservation Act 1995 • The Environment Conservation Rules 1997 • The Environment Pollution Control Ordinance 1977 • City Corporation Ordinances and Pourshava Ordinance 1977 Draft "Solid Waste Management Handling Rules" • The Environment Court Act 2000 • Development of "Battery Waste Recycling Rules 2006"	O
	Economic	No specific economic instruments observed	☒
	Voluntary	Voluntary Initiatives by Government & Industry • Promotion of Cleaner Technology & Waste Minimization	O
	Information	Sustainable Environment Management Programme (SEMP) Dhaka Declaration 2004	O
	Procedural	Decisions on banning Polythene Shopping Bags	O
Support for 3R-related Activities		• Solid Waste Management Cell, Dhaka City Corporation • No specific support for 3R-related activities except few initiatives such as community-based waste recycling and resource recovery	O
Environmental Education		No specific programs emphasizing environmental education	☒
Scienc and Technology		• Implementation of a National Program for Recovery and Recycling of Refrigerants	O
Reduction of Barriers to International Flow		• Acceded the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal in 1993	O
International Cooperation		• Bangladesh Environmental Management Project funded by CIDA • Master Plan for the Solid Waste Management of Dhaka - Dhaka City Corporation with support from JICA • Community-based Composting Projects and Barrel Type Composting-UNICEF with 14 city corporations and Engineering • Solid Waste Management Plan for eight secondary towns of Bangladesh -Local Government Engineering Department (LGED) with support form ADB • Recycling Centers in 24 city corporations/municipalities as well as preparation of solid waste management plan-UNICEF • Urban Solid Waste Management Handling Rules of Bangladesh, and UNDP • Bio-medical Waste Handling Rules - Ministry of Environment and Forest and UNDP.	O
Cooperation of Stakeholders		Lack of cooperation among the stakeholders within the country	O
Promotion of Science and Technology for 3R		Under implementation level	☒

● Sufficient O Insufficient ☒ Gap

Gaps

Example: Bangladesh

3RKH Secretariat, Asian Institute of Technology (2008)
http://www.faculty.ait.asia/visu/Prof%20Visu's%20CV/Books%20and%20research%20reports/3R%20Gap%20Analysis%20Book%20(Printed%20Version).pdf

S. No	Attributes Unit Operation or Step in MSW Management	Technical Feasibility		Managerial Feasibility		Social acceptability		Low Capital Cost Advantage		Low O & M Cost Advantage		Recycling Potential	
		C	D	C	D	C	D	C	D	C	D	C	D
1	Segregation at Source	5	8	8	6	6	6	5	8	6	8	6	8
2	Transportation	7	8	8	7	7	7	5	7	5	7	4	6
3	Pre-processing of Wastes	6	7	6	6	7	6	6	6	6	6	5	7
4	W to E: Biomethanation	7	8	7	7	7	6	6	7	6	7	7	8
5	Conventional Composting	6	6	6	6	7	6	5	7	6	7	6	7
6	Vermi-Compostiing	4	7	4	7	6	6	5	7	5	7	5	7
7	Mechanical Composting	6	6	7	6	6	5	5	6	5	6	5	6
8	W to E: RDF Production	7	5	7	5	8	6	6	5	6	5	6	6
9	W to E: Incineration	9	3	8	4	6	4	6	4	7	4	6	4
10	W to E: Pyrolysis / Gasification	8	5	7	4	6	4	5	4	6	3	6	5
11	W to E: Plasma Arc Gasification	6	3	5	3	7	4	4	3	4	3	6	3
12	Disposal of Road Sweeping & C&D	7	5	6	5	6	5	6	5	6	5	5	5
13	Engineered Sanitary Landfill	9	4	8	4	8	3	7	4	7	4	4	2

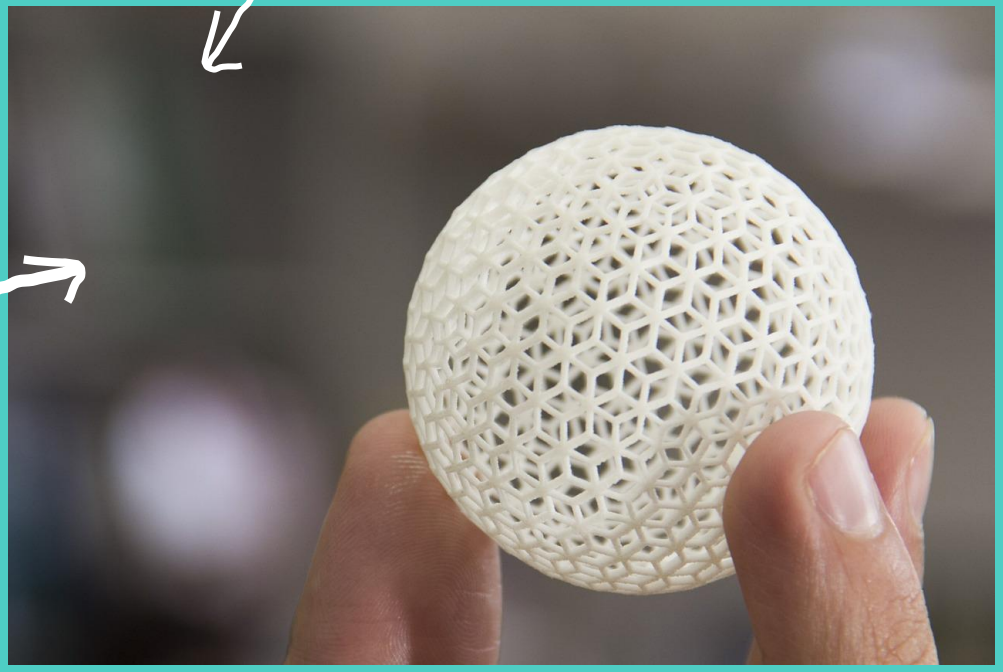
May be treated as indicative.

Decision support for Selection of W2R Technologies

Government of India

Report of the Task Force on Waste to Energy (Volume I), Government of India

Protoprint empowers urban waste pickers to produce 3-D printer filament themselves from the plastic waste they collect.

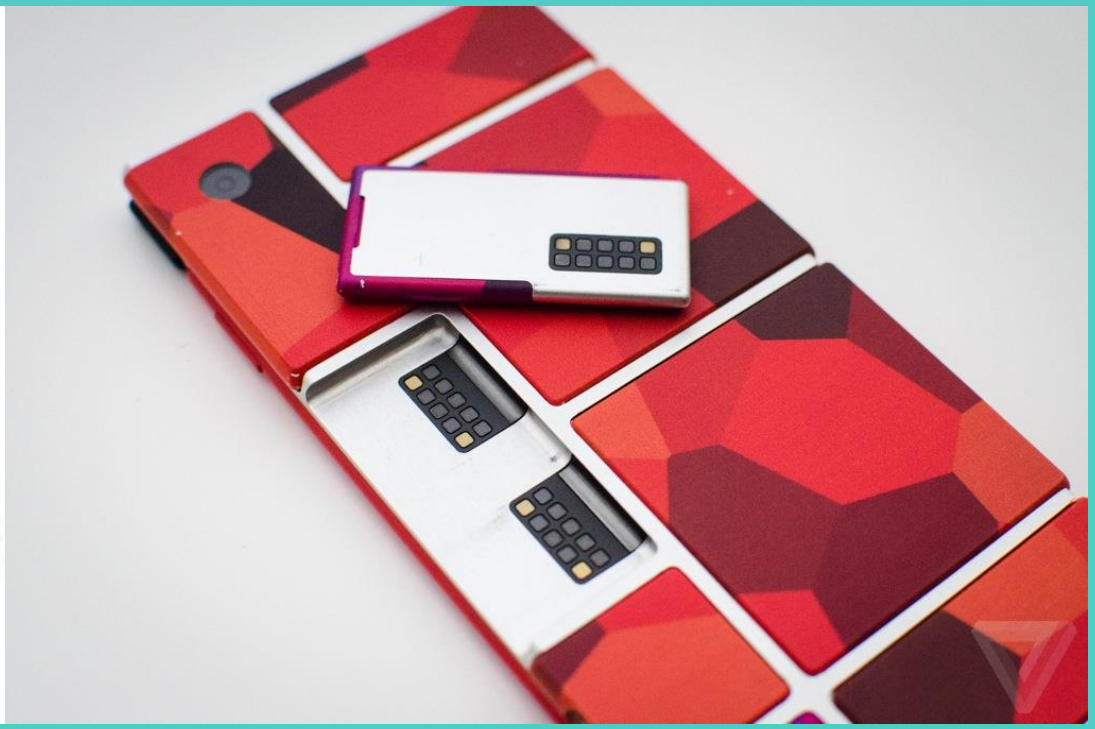


- greater efficiency of design
- local production
- additive manufacturing instead of injection molding, therefore less waste
- bottom-up approach

3D printing

Breakthrough 3R technology

http://www.triplepundit.com/2014/12/3d-printing-bring-world-closer-circular-economy/



Repurposing phones

Project Ara, Google's Advanced Technology and Projects group

http://www.projectara.com/more/

http://www.theverge.com/2014/4/15/5615880/building-blocks-how-project-ara-is-reinventing-the-smartphone

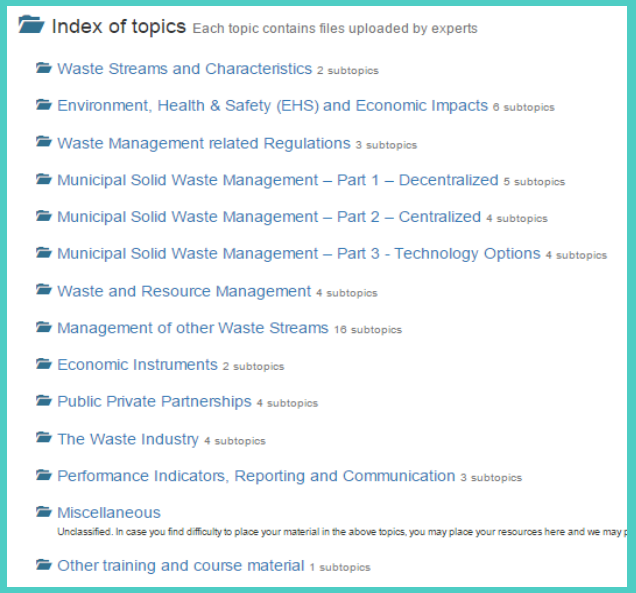
Professional postgraduate degree and certificate training on "Holistic Waste Management."

Strengthening the knowledge base

University Consortium

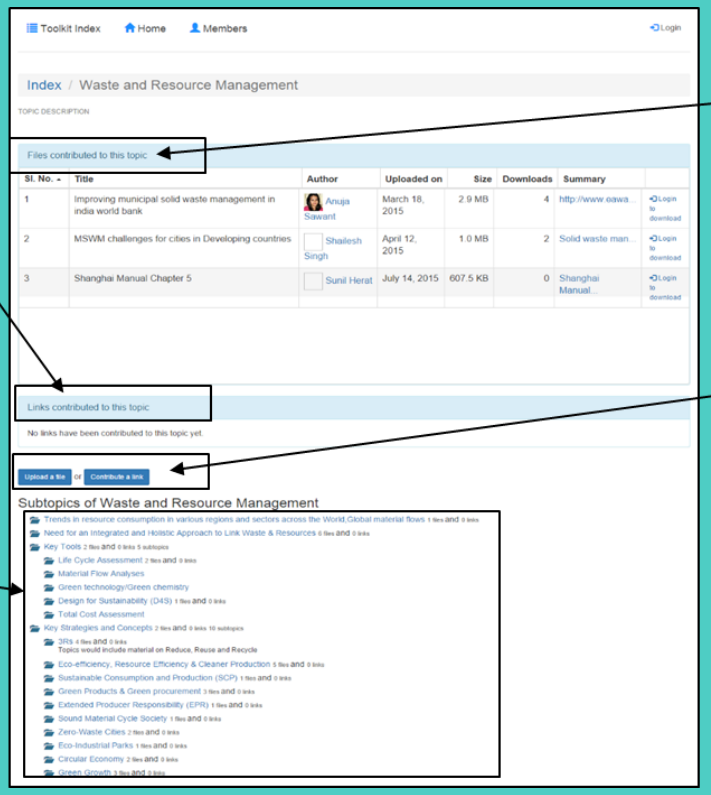
UNEP-IETC

Strengthening the knowledge base



Links contributed to the topic

Hierarchy of topics



Files Contributed to this topic

Two buttons to contribute a link or a document

Integrated Waste Resources Toolkit

EMC and Griffith University

Collaborating Centre Of Sustainable Consumption and Production

cscp
COLLABORATING CENTRE ON SUSTAINABLE CONSUMPTION AND PRODUCTION

- The Centre provides scientific support to clients from the private and the public sector, such as UNEP and other organisations in the field of SCP.

cscp
SUSTAINABLE LIFESTYLES

cscp
SUSTAINABLE INFRASTRUCTURE, PRODUCTS AND SERVICES

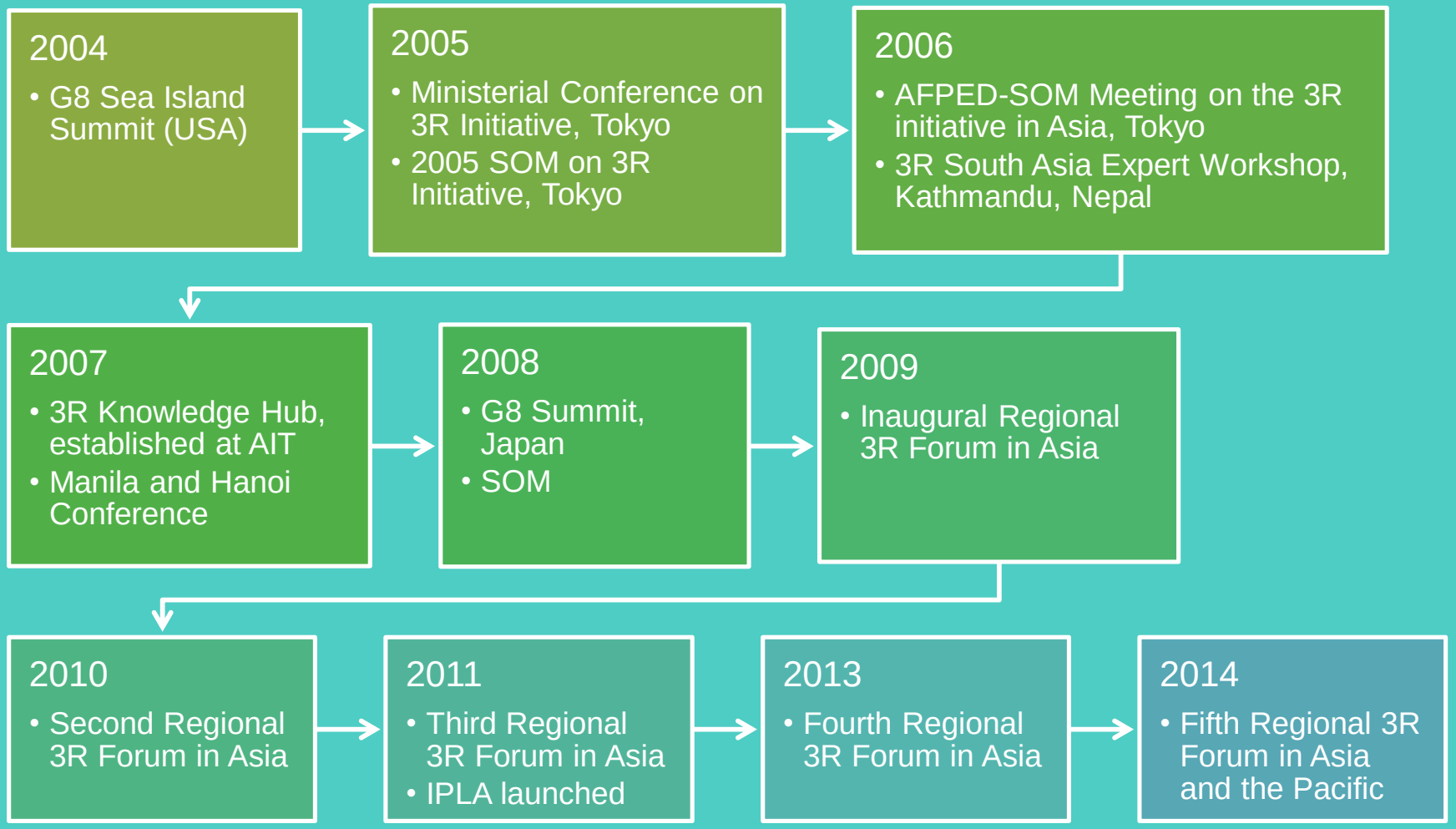
cscp
SUSTAINABLE BUSINESS AND ENTREPRENEURSHIP

http://www.scp-centre.org/

4.

The Regional 3R Forum

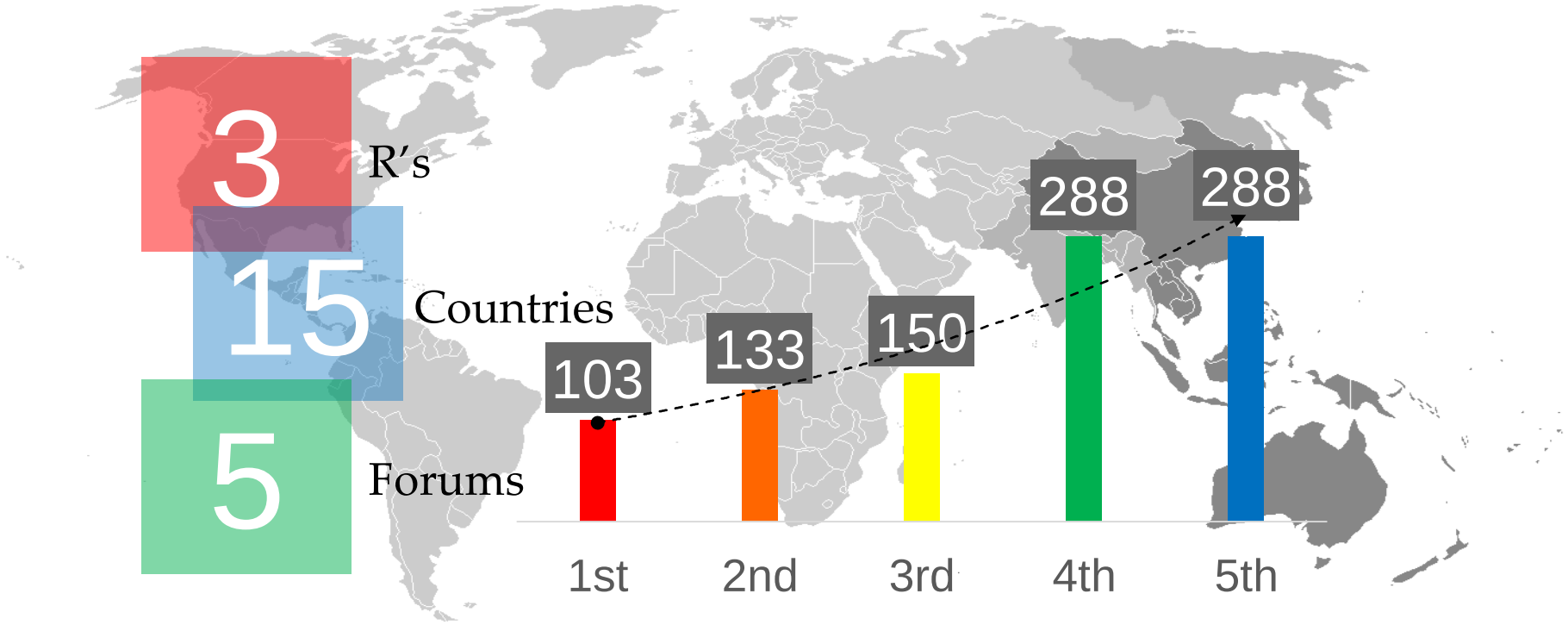
Connecting the Dots to form a Circle

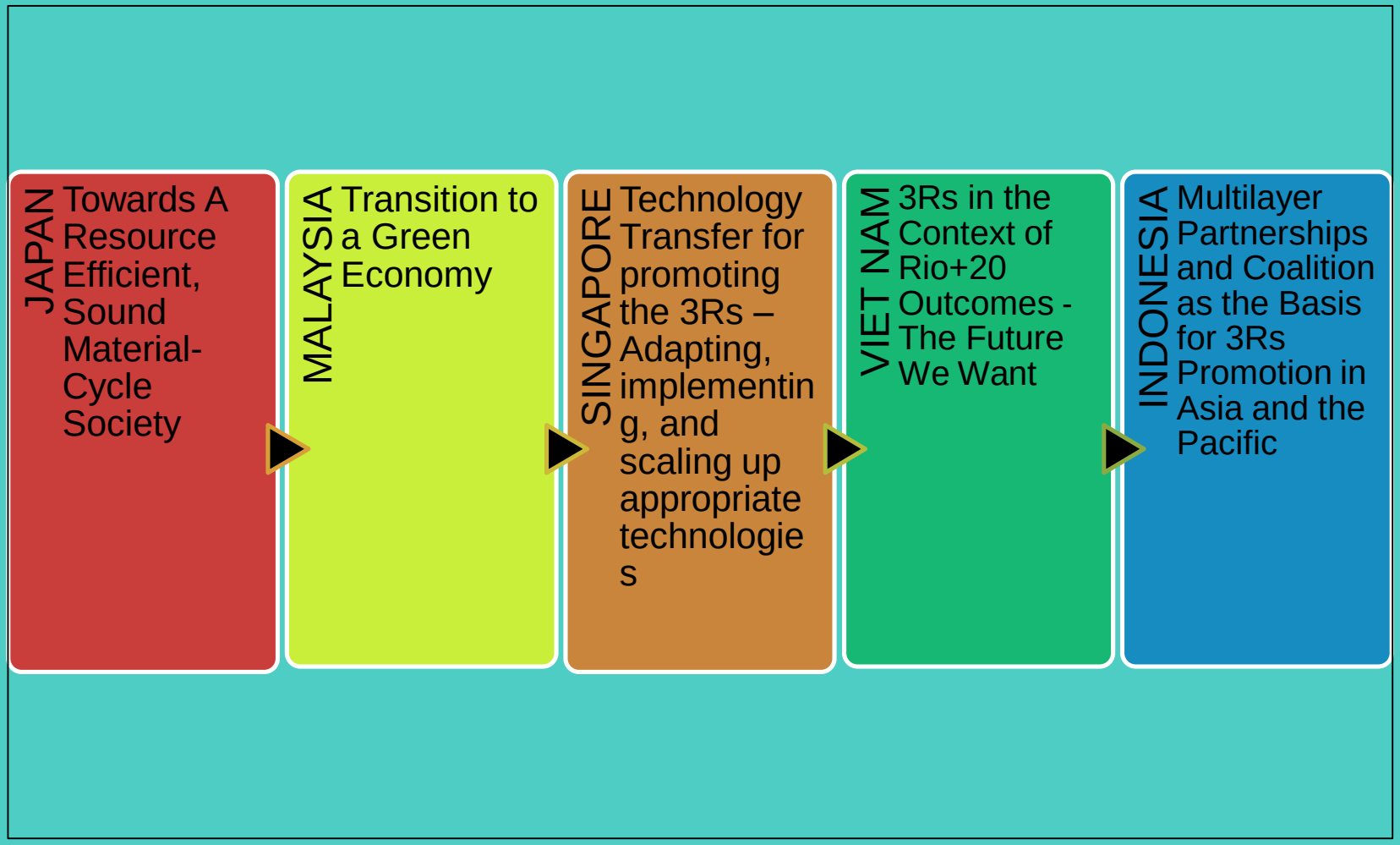


3R Forums

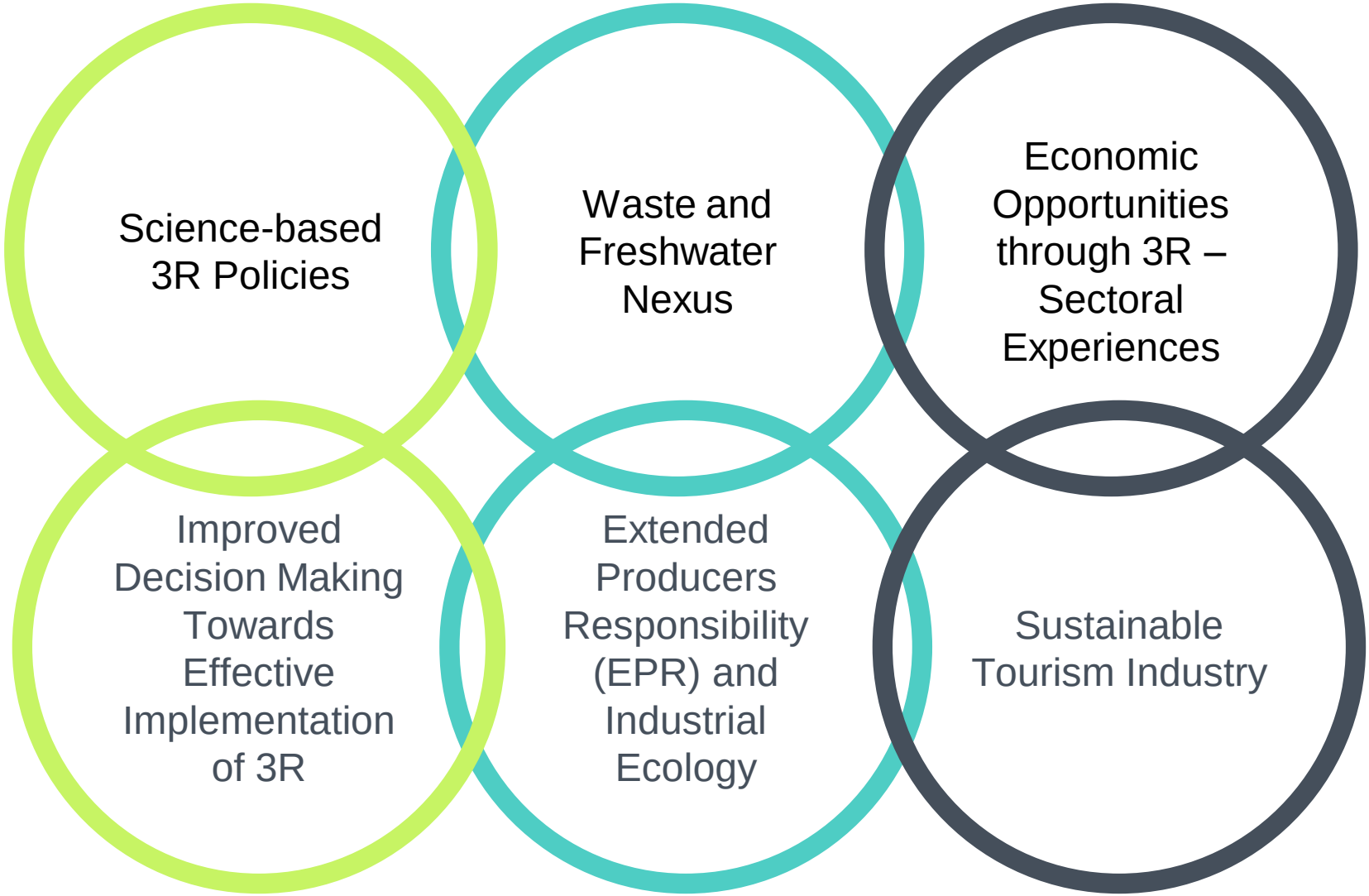
Goal of the Regional 3R Forum in Asia and the Pacific is to achieve low carbon and sound material cycle societies

Increasing Participation




JAPAN
Towards A Resource Efficient, Sound Material-Cycle Society
MALAYSIA
Transition to a Green Economy
SINGAPORE
Technology Transfer for promoting the 3Rs – Adapting, implementing, and scaling up appropriate technologies
VIET NAM
3Rs in the Context of Rio+20 Outcomes - The Future We Want
INDONESIA
Multilayer Partnerships and Coalition as the Basis for 3Rs Promotion in Asia and the Pacific

6th Forum


Science-based 3R Policies
Waste and Freshwater Nexus
Economic Opportunities through 3R – Sectoral Experiences
Improved Decision Making Towards Effective Implementation of 3R
Extended Producers Responsibility (EPR) and Industrial Ecology
Sustainable Tourism Industry

Way Ahead

National 3R Forums – We need to decentralize and network

Policy Harmonization – Let us set common goals

Data, Information and Knowledge
Awareness, Education, Training
3R Centres of Excellence on Technologies

The Waste Business – Are we missing the right audience?
More Evidence to make Economic Case?

Do we change our Language? Waste? or Material?

Thanks!

Any questions?

You can find me at
prasad.modak@emcentre.com