Challenges and Opportunities with Green Technology Transfer on the 3R

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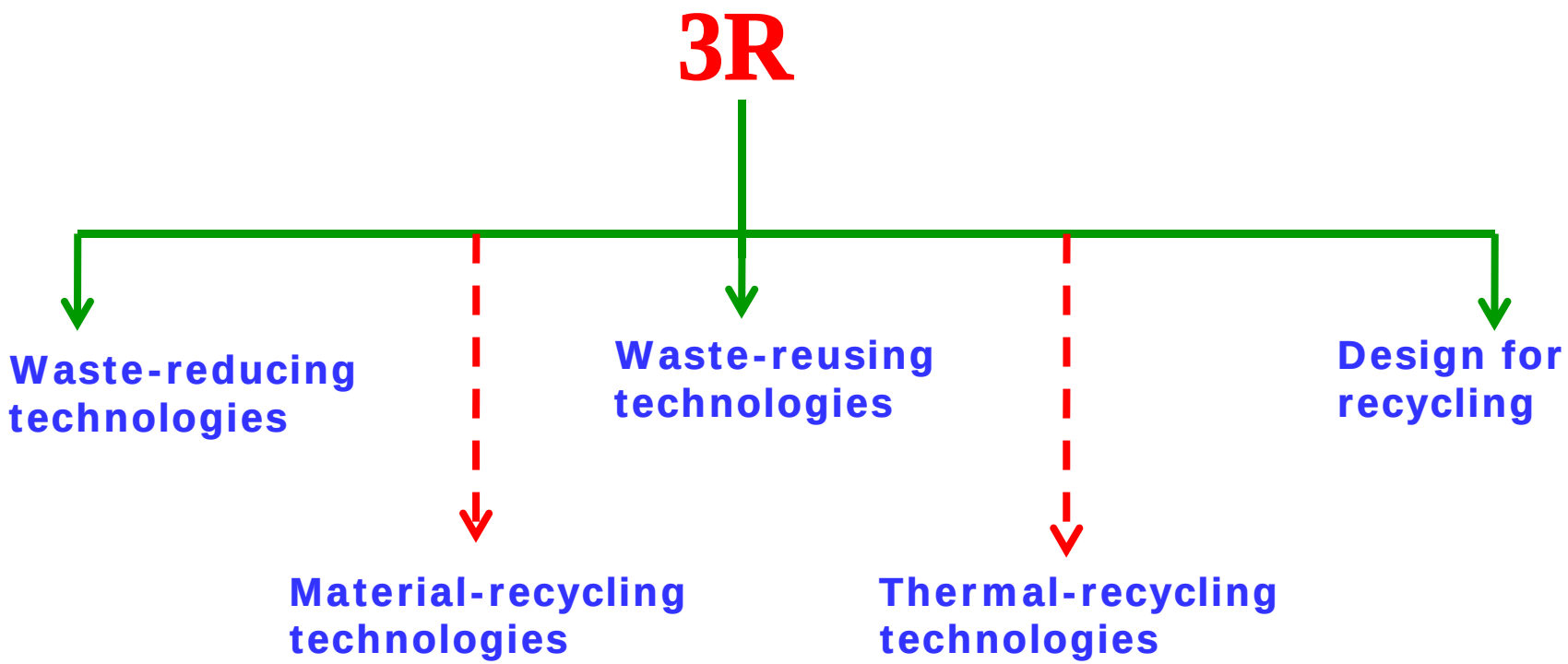
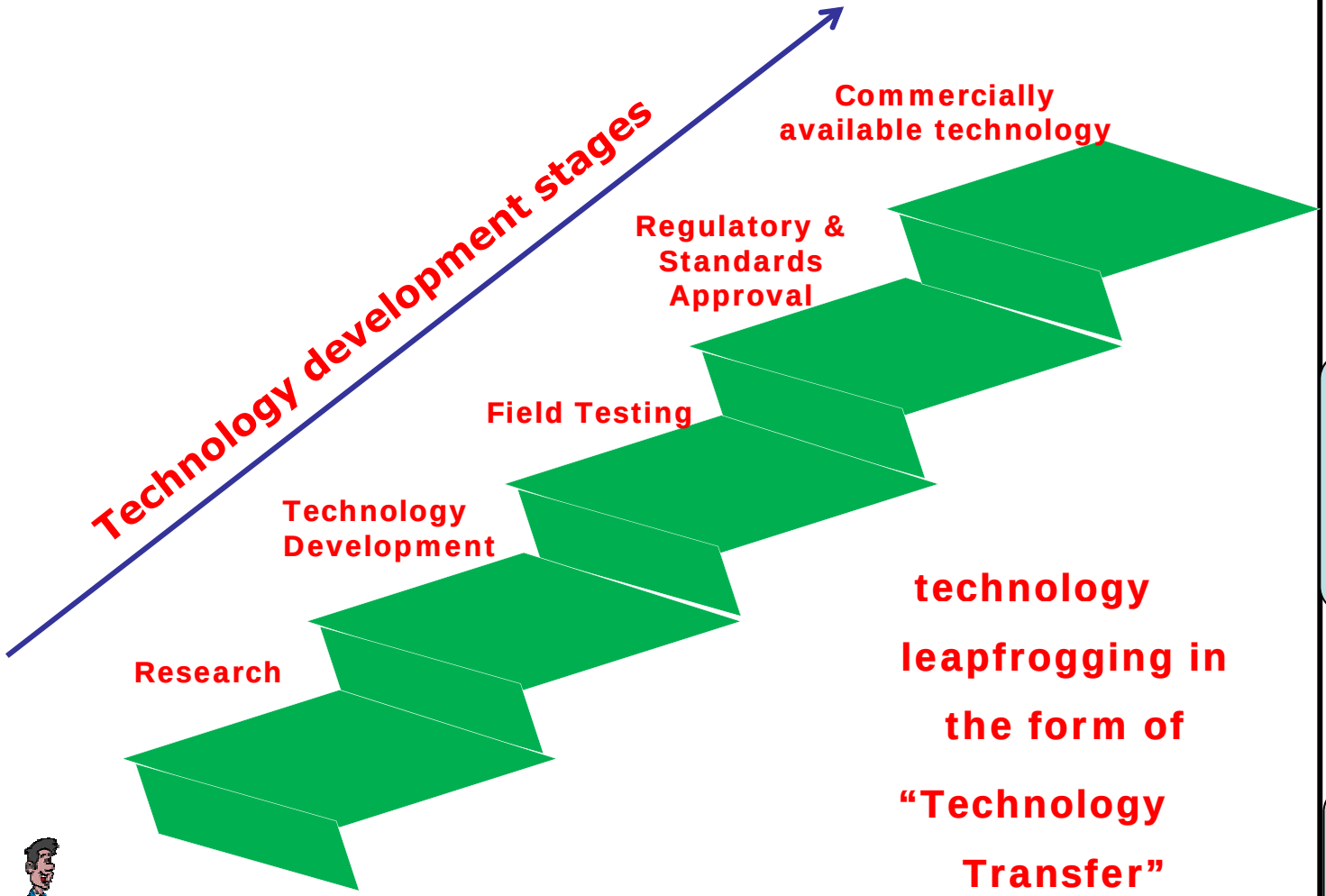
3R and Green Technology

Green Technology: Technology that prevents waste from being generated in the environment and keeps resources moving in the material cycle.

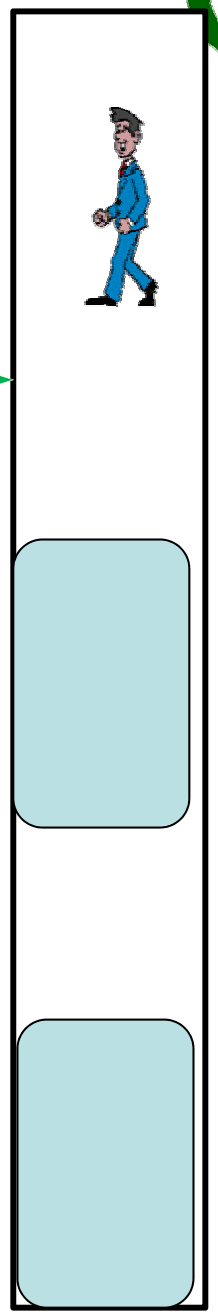


3R : Green Technology

Technology Transfer (TT)



technology leapfrogging in the form of "Technology Transfer"



What we are dealing with?

- **Technical**

Mostly associated with the technology itself i.e. hardware / physical technology

- **Management**

Mostly associated with the overall process of transfer of technology from "X" to "Y" and covers "N" number of issues

North-South TT
Failed Treatment Facilities….1

- Municipal Corporation of developing country built an incineration
- Capacity of 300 tonnes/day of municipal waste
- Segregated waste as input
- To generate 3 MW of power
- Cost around US$3.5 million
- Technical assistance from developed country

CLOSED

- ✓ Designed for segregated waste as input, which was not practiced by the households or promoted by the municipality
- ✓ Waste had a very low heating values
- ✓ High percentage of inert materials

Failed Treatment Facilities….2

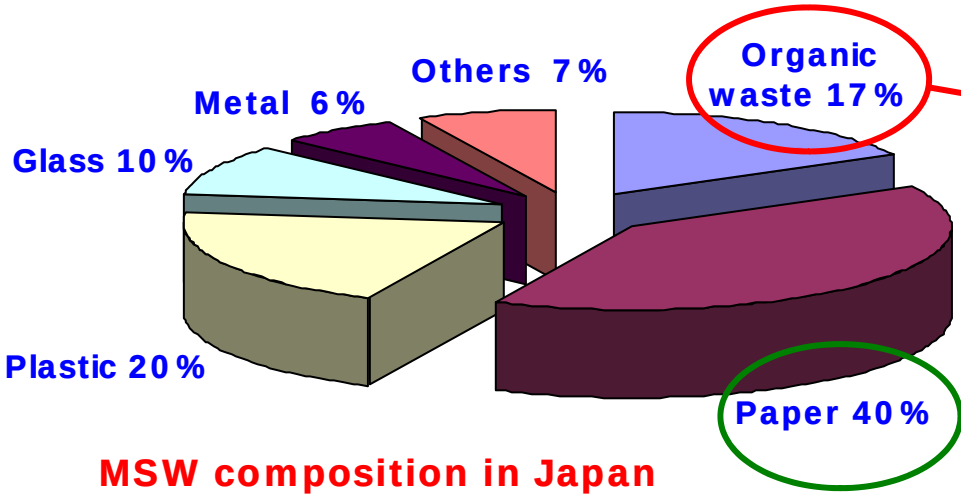
- Municipal Corporation of developing country built an anaerobic digestion plant
- 500-600 tonnes of MSW per day
- 5MW waste-to-energy project
- US$18 million
- Private companies from developed country provided the technical inputs
- Host country firm supplied the human resources and execution on build-own-operate(BOO) basis

CLOSED

- ✓ Plant was not able to run on its full capacity due to high level of inert materials in the waste
- ✓ There was a operational difficulty that lead into permanent failure
- ✓ Design assumptions were based on the European waste and waste management practices

This is called hardware transfer, not the technology/knowledge transfer

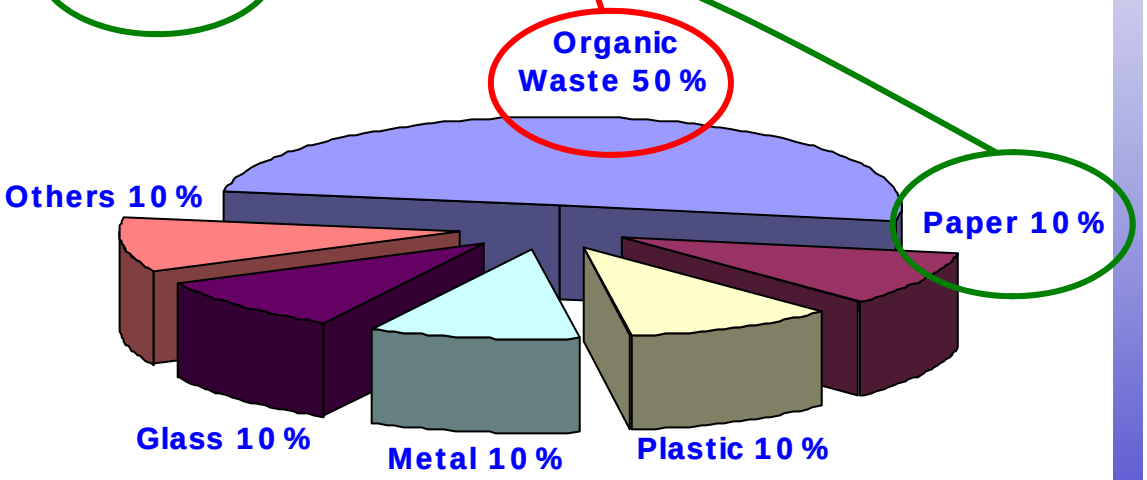
Waste Composition



MSW composition in Japan

Fundamental differences in culture and lifestyle reflect on waste characteristics

Quantity – even with higher population recyclable waste will be less in developing countries resulting in less than minimum volumes required for recycling



MSW composition in a typical Asian developing country

Direct adoption of recycling technologies may not be possible

SW Carrying Vehicle with Compactor On!

- Not suitable for SW with high moisture content
- If compacted juice comes out
- Trickle all the way during transportation

Does one size fits all?






Then…….. what is needed…???

- **Development needs must be recognized first**
- **Technology solutions can be tailored accordingly**
- **Important to recognize diversity between and within countries**
- **Technology needs to be both appropriate and financially sustainable under local condition**

South-South TT

Bangladesh "Waste Concern's Composting Model"

Upto 3 tons /day

Small Scale

3 to 10 tons /day

Medium Scale

>11 tons /day

Large Scale

Large Scale Compost Plant in Bulta, Narayanganj

- 130 tons/day of organic waste treated
- 32-39 tons/day of compost production capacity
- Employment opportunity for 90 persons

Barrel Type Composting System

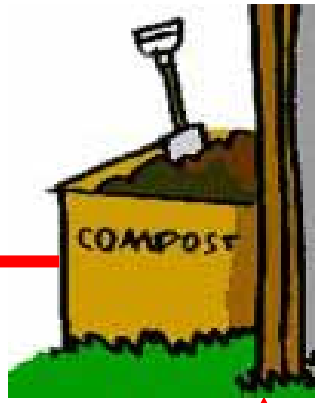
- 52195 m^3 /yr land filling avoided
- 15600 tons CO_2 e /yr. of GHG emission reduction

Green TT for 3R

Visu 10

Replicable PPP Model of Bangladesh in South

Rural Farmers



- Household waste collection
- Waste collection from vegetable markets
- Promotes source segregation & community participation

Urban Population

Organic Waste

Compost Plant Joint Venture WCC-WWR, FMO, Triodos, EVD

Dhaka City Corporation (DCC)

Concession agreement for 15 years

Public Private Partnership

Community | Private Sector | Public Sector

WCC- Waste Concern Consultants
WWR – World Wide Recycling
International Business and Cooperation (EVD)

FMO- Netherlands Finance Development Company
Triodos Bank

Wongpanich Private Waste Recycling, Thailand: South- South TT

- Recognized as a model for recycling business in Thailand and neighboring countries
- Provides important benefits such as
  - poverty reduction
  - create job opportunities
  - market value for waste
  - educate people
  - and increase awareness within community

Wongpanich Waste Recycling Factory, Thailand

Factory Building

Recyclable transportation

Storage of Separated & Cleaned Plastic Containers

Wongpanich Low Cost Technology for South….1

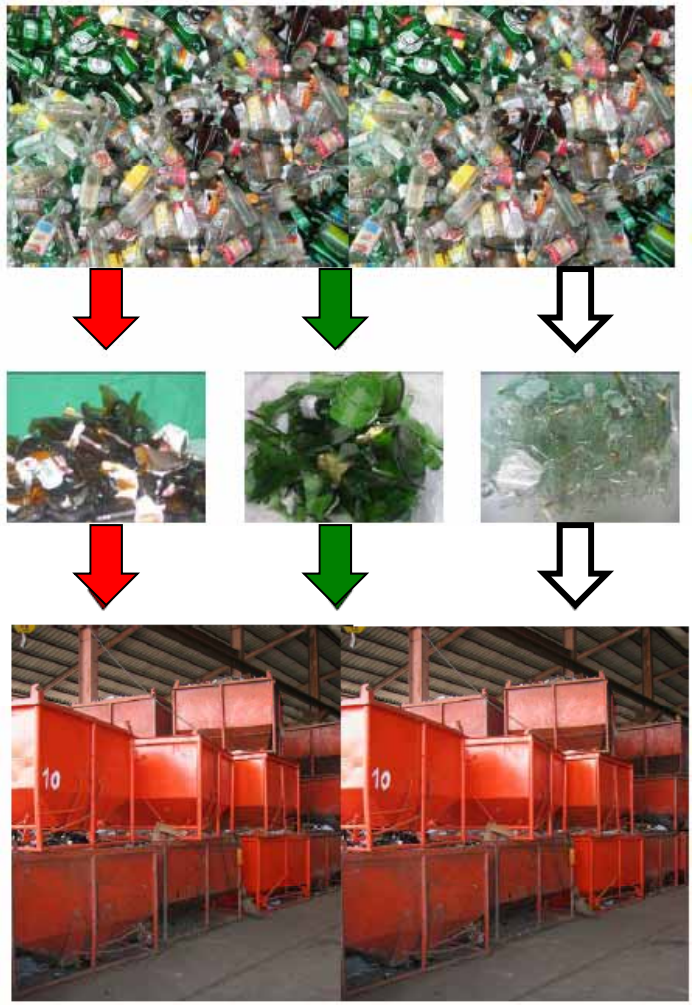
Plastic Scrap Management

Zinc / Zinc Cane Management

Wongpanich Low Cost Technology for South….2

Aluminum Management

Glass Bottle / Glass scrap Management

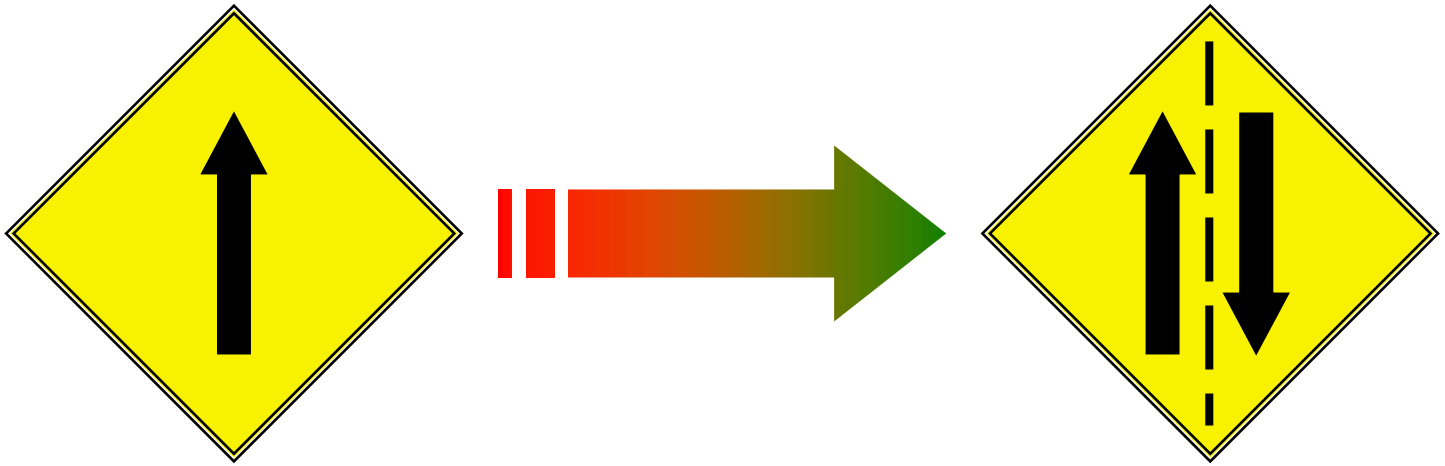


Strengths for South-South TT

- Desired and suitability to expand activities in the region
  - Wongpanich is active and desired to establish their presence in neighboring countries such as Lao PDR, Cambodia, Vietnam
  - Similarities in the waste characteristic and streams in South developing countries
  - Similarities in the National level institutions in South Asian countries
- Affordable technology
- All of the machinery are local made
- Available regional institutional, financial mechanism for regional cooperation
- Technical know-how, expertise, spare parts for technology up gradation / repair available within the region and countries

Consumption to Circulation

Resource consumption has been increasing across the globe, particularly in Asia



Consumption Circulation

Resource Consumption to Resource Circulation… can be achieved only by having the right 3R technology in place

"Having the right 3R Technology" – often connects to Technology Transfer (TT)

Current Waste Sector in Developing Countries…

Collection (Mostly bulk collection by local authority)

Informal recycling business

Manual shredding (minimum safety measures)

Transportation (contractual / Semi-formal)

Segregation / Sorting (waste pickers, mostly women's & small kids)

Landfilling, Open dumping / burning

After 3R Technology Transfer

Collection (Organized formal collection system)

Collection (Mostly bulk collection by local authority)

Transportation (Formal)

Transportation (contractual / Semi-formal)

Rotary screen

Effluent treatment plant

RRC/RDF-WTE Resource recovery center, Refuse derived fuel, Waste to energy

Pet Bottles

Aluminum cans

Landfilling, Open dumping / burning

RDF

Power plant

Sanitary landfill

Segregation / Sorting

Air classifier

Waste conveyer

Informal recycling business

Waste dryer

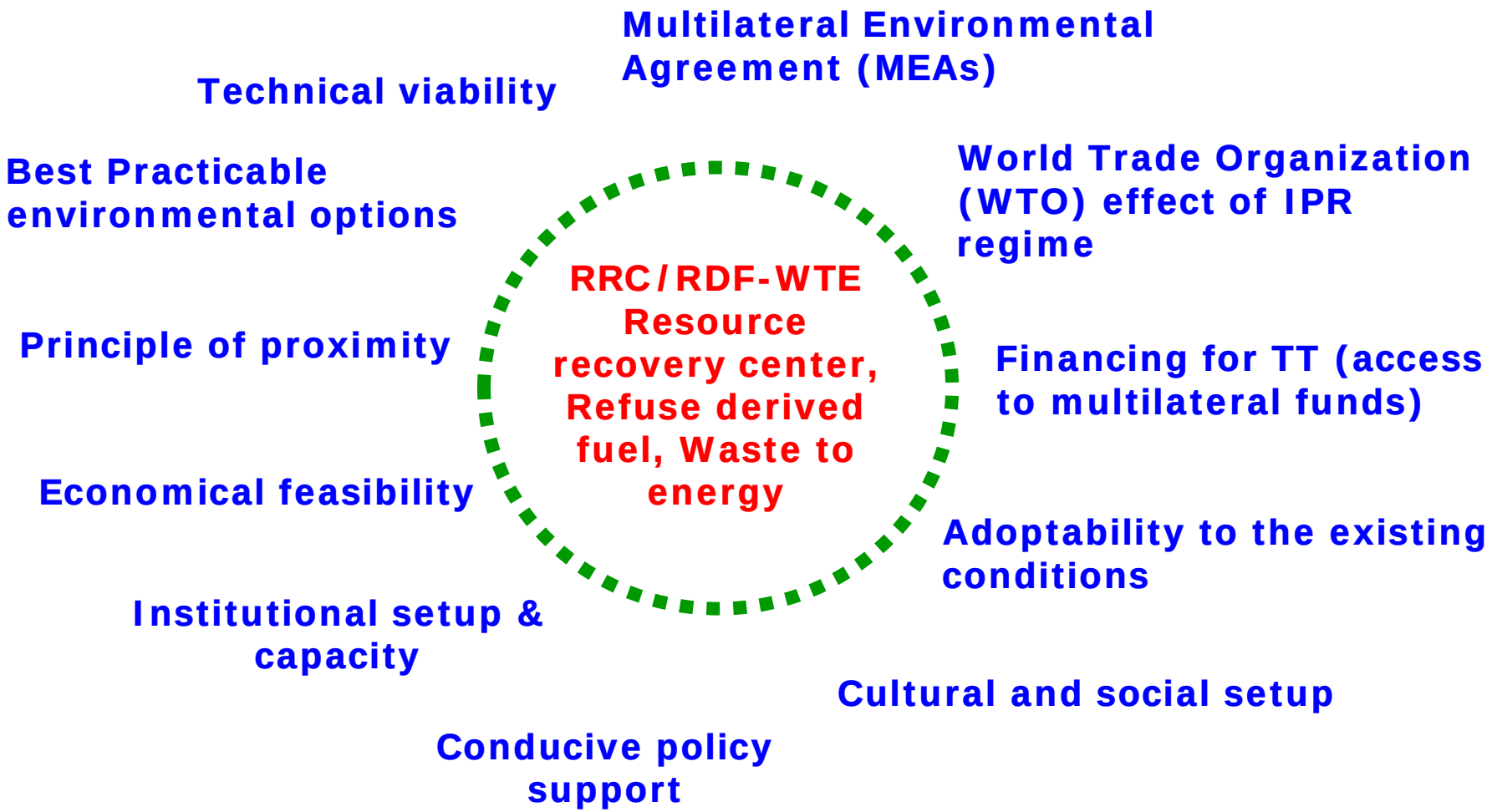
Waste shredder

Manual shredding (minimum safety measures)

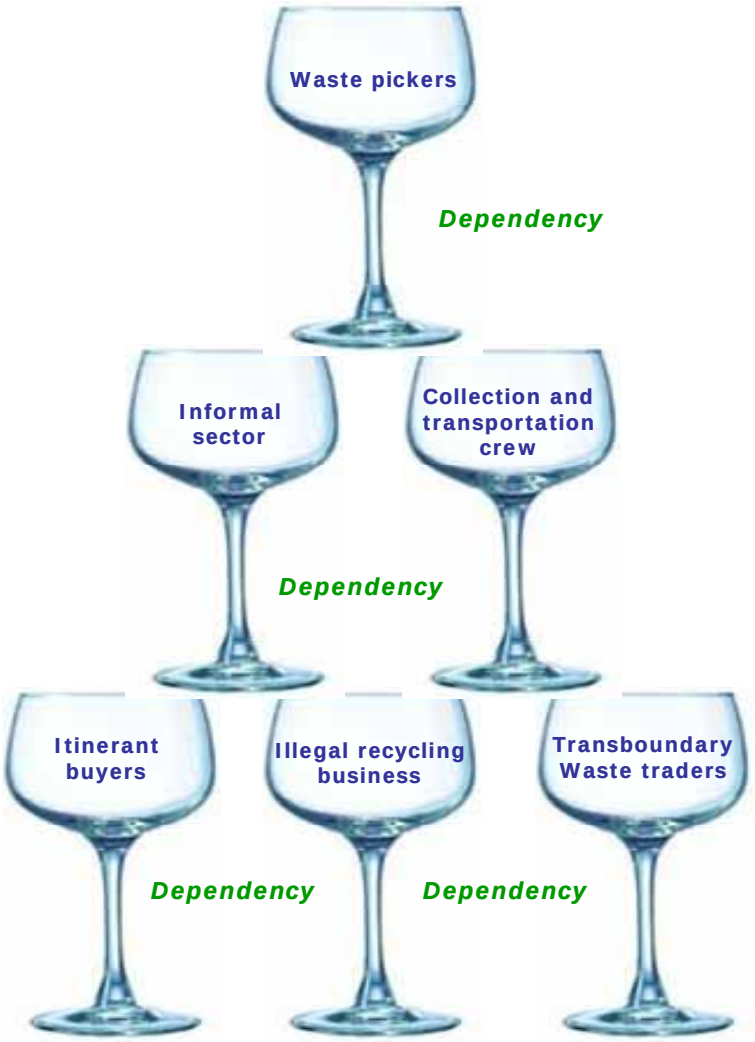
Bag splitter

(waste pickers, mostly women's & small kids)

What it brings in light?

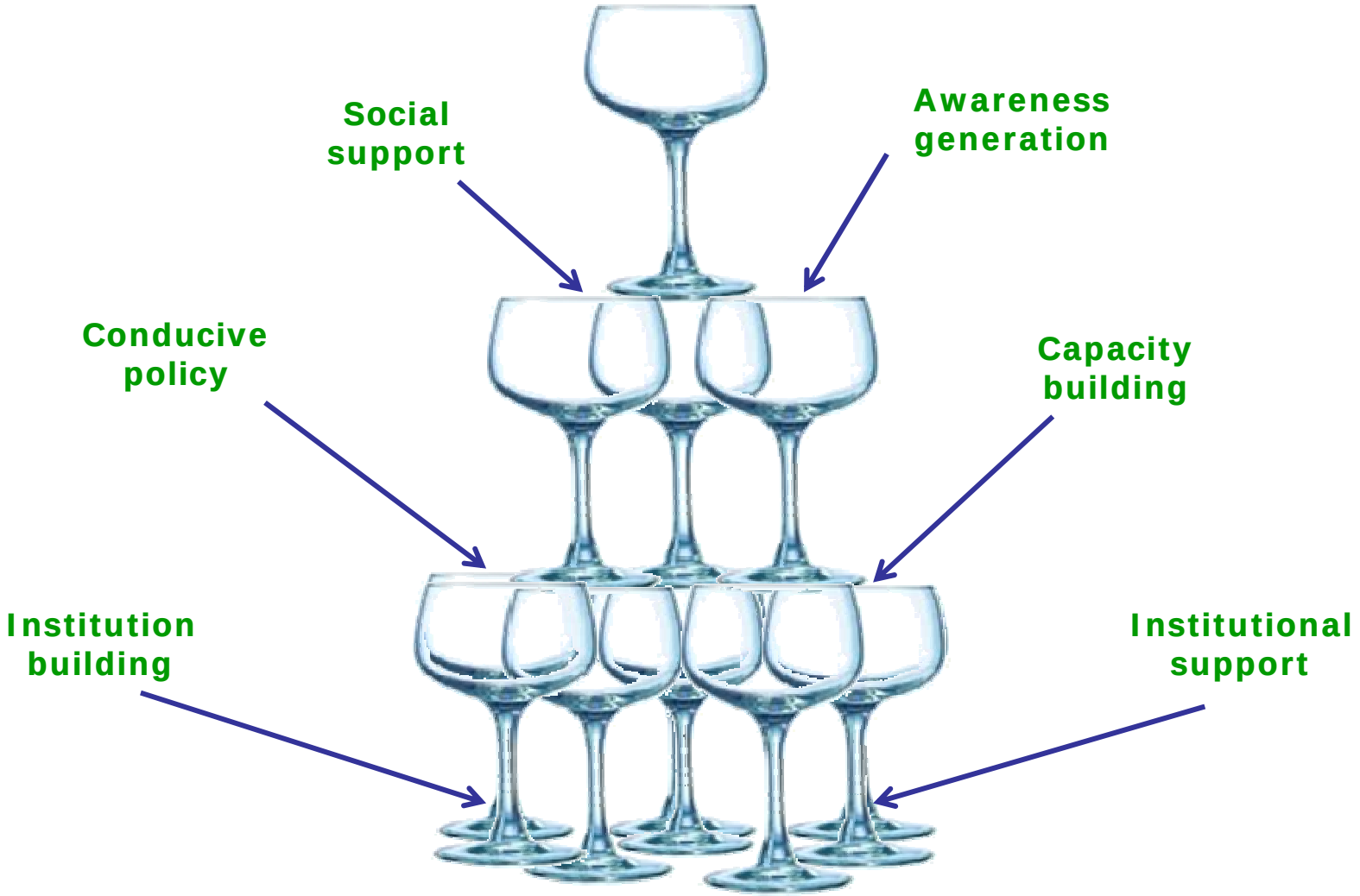


Handle with Care!



- ✓Highly unorganized
- ✓Provide livelihood to number of peoples
- ✓High share and contribution in the recycling waste business
- ✓Poorly acknowledge
- ✓Considered as business of poor and homeless people
- ✓Human force is the main strength
- ✓Mostly women's and small kids
- ✓Good network and communication channel among the waste traders

How to prevent from splintering?



Overview of TT Challenges and Opportunities

Challenges

- Economies of Scale
- Financing of Recycling Industries / TT projects
- Training – uptake ability
- Diverse stakeholders
- Enabling policies
- Mechanisms for IPRs
- Social exclusion

Opportunities

- Create new eco-friendly products and services
- Create social entrepreneurs
- Create green jobs
- Increase cash flow
  - poverty alleviation
- Capacity building of stakeholders
- Conserve resources
- Social inclusion
- Boost in the regional and international cooperation

Take-home Message…1

- TT related policy issues on one hand and practical issues on the other – both need to be equally addressed
- Practical issues have to be resolved to keep resource circulating with the help of recycling industries
- Policy and strategy development – in full swing – thanks to the initiatives of various organizations.
- Challenges to Green TT for 3R are omnipresent – equally present are the opportunities
- Transforming challenges to opportunities through concerted regional action – Regional 3R Forum an initiative in this direction
- 3R TT has strong social dimension, potential to affect livelihood of informal sector; thus host country got long stick to balance with

Thanks for your attention!