

Fourth Regional 3R Forum in Asia

19 March 2013, Tuesday

Calidas Landmark72, Hanoi , Viet Nam

3Rs Society in Asia

- Lessons Learned from 2011 Great East Japan Earthquake and Tsunami

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Lessons learned from 2011 Great East Japan Earthquake and Tsunami

Great East Japan Earthquake

- Around 14:46 on March 11, 2011, a massive earthquake with a magnitude of 9.0 struck East Japan Coast.
- The ensuing tsunami swept across many cities and villages along the Pacific coast.

http://www.mofa.go.jp/j_info/visit/incidents/announcements.html#current-situation



Damages Caused by GEJ E&T

The number of deaths	15,881
The number of missing	2,668
The number of deaths related to the disaster	2,303
The number of refugees	315,196
Totally collapsed buildings or houses	128,801



Total quantities of disaster waste

Total of 3 prefecture (Fukushima, Iwate, Miyagi)

環境省災害廃棄物推計量の見直し(平成24年5月21日)を反映していない。

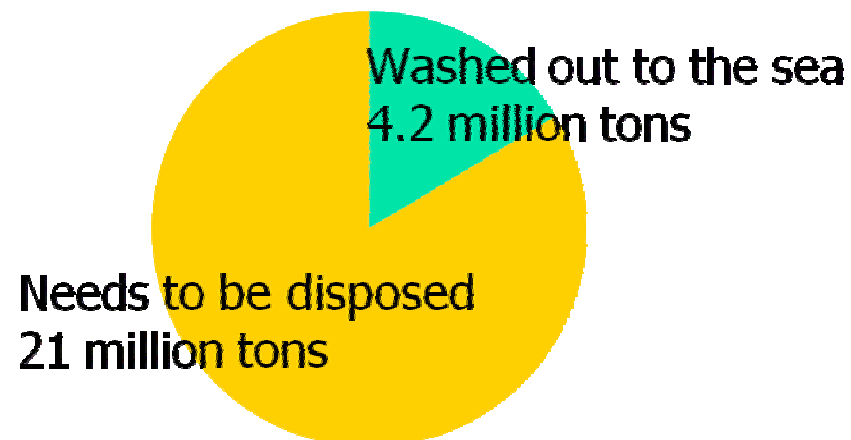
25 million tons

- Quantities which washed away to the sea

4.2 million tons

- Quantities which need to be disposed

21 million tons





Disaster waste in temporary storage site



Electronic wastes, such as laundry machine are sorted out and recycled based on the Electric Appliance Recycling Law.



Automobile graveyard: About 10,000 cars became scrapped in Sendai city alone.

Master Plan for Disaster waste

- In May 2011, the national government announced the guidelines (master plan) for disaster waste.
- Targets date for the complete transfer of disaster waste to temporary storage sites by March 2012
- Target date for final disposal of disaster waste by March 2014.
- In Iwate and Miyagi, a total of 31 temporary incinerators were constructed.

-Master Plan for Disaster waste - Basic Rules for Waste Processing and Disposal

1. Waste shall be sorted and separated as much as possible at the disaster areas.
2. Recyclable materials shall be recycled and reused as much as possible.
3. Non-recyclable combustible materials shall be incinerated, and the ashes shall be disposed of by landfill.
4. Non-combustible materials that cannot be recycled or reused shall be disposed of by landfill.

*Activity to support solid
waste management in disaster
area*

*Kazuhiko Yoshizawa
Akashi City , Hyogo, Japan*





クリーンヒルセンターより収集作業へ出発する様子



被災状況



避難所での収集作業の様子



がれき仮置場での収集作業の様子



宿舎周辺の住民と交流している様子



気仙沼市廃棄物対策課の職員との記念撮影

Waste Quantity Generated in the Asia

$$Q = P \times F(\text{GDP})$$

Where

Q=ton/year P=population

F(GDP)=ton/person/year

GDP=dollars/person/year

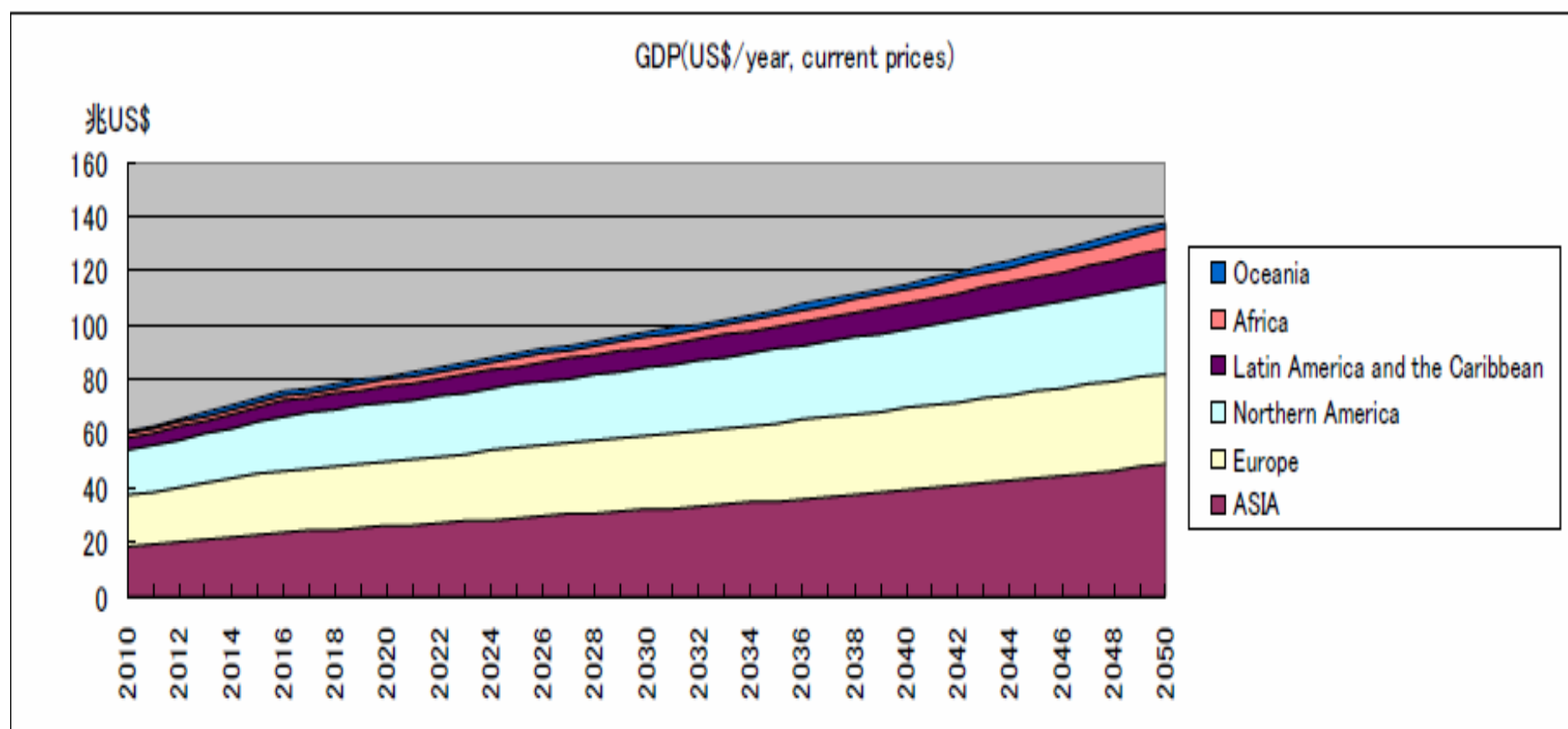
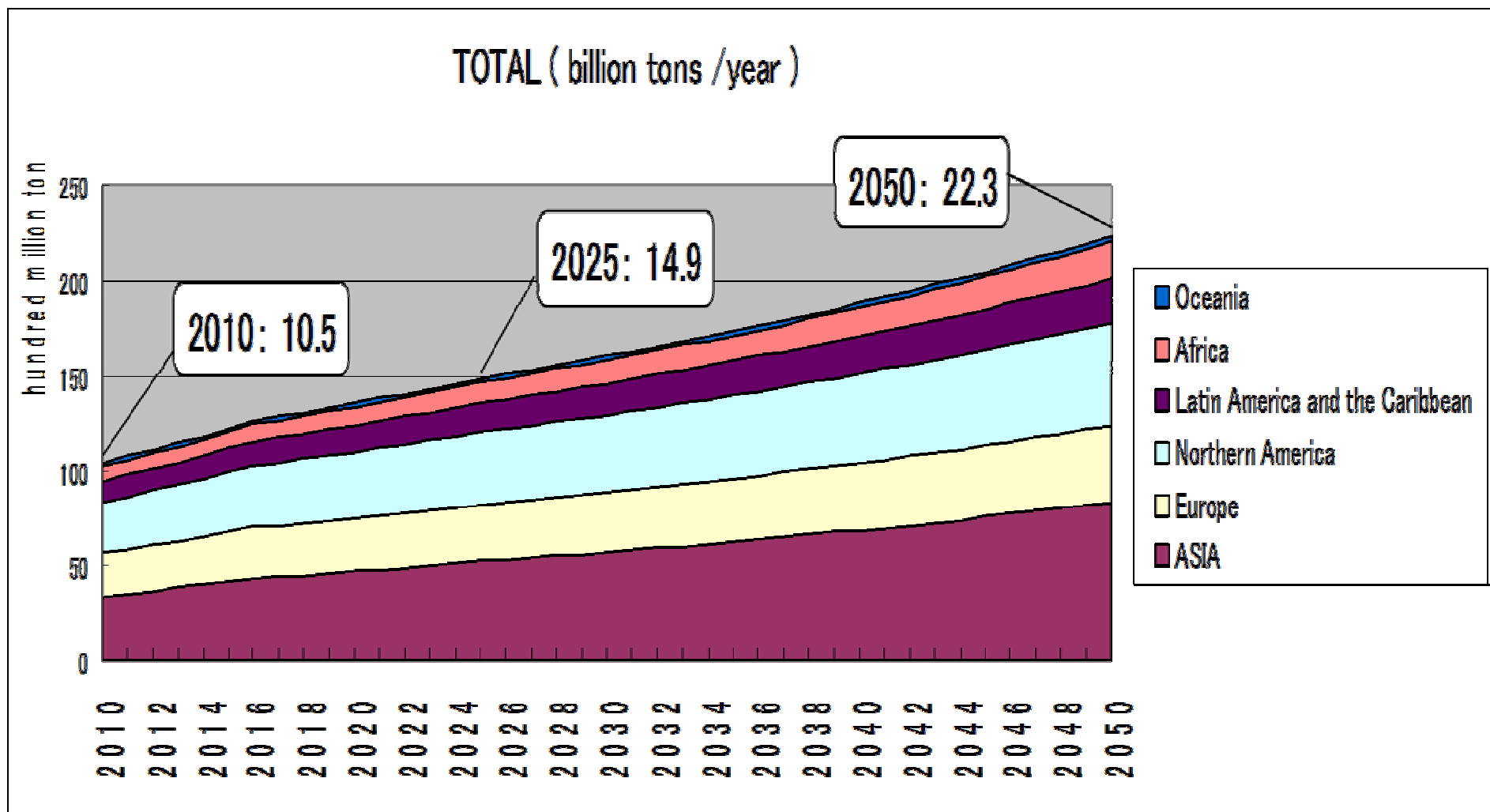


图 4 GDP (2010—2050 年)



Solid Waste to Be Generated in the World(2010-2050)

Table 1 Forecasts of global population, GDP and waste volume generated

	2010	2025	2050
Population	6.9 billion	8.1 billion	9.2 billion
GDP	US\$61 trillion	US\$89 trillion	US\$138 trillion
General waste	1.5 billion tons	2.4 billion tons	3.1 billion tons
Industrial waste	8.6 billion tons	12.5 billion tons	19.2 billion tons
Total (general + industrial + hazardous waste)	10.5 billion tons	14.9 billion tons	22.3 billion tons

Source: Masaru Tanaka, Research Institute of Solid Waste Management Engineering;
Research on Estimation of Global Waste Generation and Future Predictions
(2011 revised edition)

Waste management in Asia



Waste pickers in Final Disposal Site in Phnom Penh, Cambodia



Open Burning in the Backyard of Hospital (Cambodia)



Dec.,30,2011 TPSI Bantargebang, Bekasi-city, Indonesia



Dec.,30,2011 TPSI Bantargebang, Bekasi-city, Indonesia



March 9 ,2013

Riverside dumping , in Nepal



March 9 ,2013

Bhaktapur ,Nepal



Kasson ,, Philippines, 2009





Crowded Street in Viet Nam



Cleaning of Street



Plastics to Recycling Village



Separation of Plastics in Recycling Village

**Mix Collection and
Disposal Open Dumping and
Burning Air Pollution and
Water Pollution Public Health
Problems**

The key SWM issues in developing countries may be pointed out as follows.

(i) increase in the amount of municipal solid waste associated with population and economic growth;

(ii) difficulty in securing land for intermediate treatment and final disposal (due to NIMBY etc) leading to serious public health risks;

(iii) inadequate legal, regulatory, and institutional framework, and lack of enforcement of laws and regulations;

**(iv) general lack of technical,
financial, and management
capacity of local governments
responsible for municipal
SWM;**

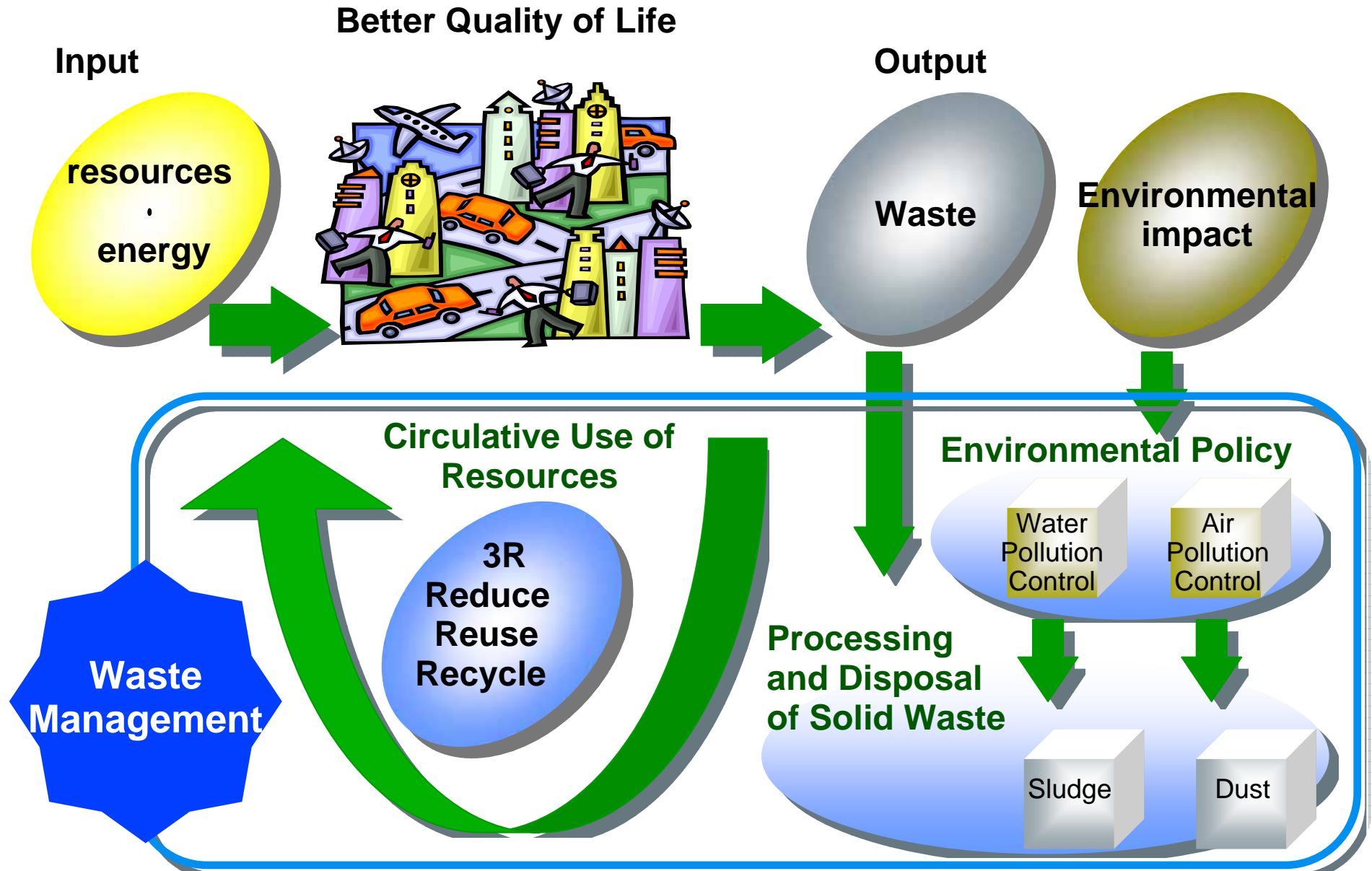
**(v) inadequate cost recovery;
leading to vicious cycle of
SWM;**

**(vi) high but untapped
potential for 3R; and
(vii) need to find out
appropriate and
innovative approaches
for improvement.**

Big Tsunami is coming

Tsunami like Huge Garbage,
Construction and Demolition waste,
E-waste, Hazardous waste,
Mercury containing waste,
Asbestos, and PCB Waste.

3R Society in Asia



Lessons Learned

**PREPARATIONS BEFORE THE
DISASTER OCCURS ABOUT HOW TO
MANAGE DISASTER WASTE**

**GOOD RELATIONSHIP AMONG
MUNICIPALITIES TO HELP EACH
OTHER AND PREPARE HOW TO
HELP OTHERS**

3R approach is good for
disaster waste management

**NOT ONLY PHYSICAL ASSISTANT
BUT ALSO ENCOURAGEMENT ARE
VERY WELCOME**

Conclusions

It is necessary to promote 3Rs in Asia region with strong leadership in each country and region.

It is necessary to create IP3R (International Panel on 3R) to promote 3R in the world.