

Workshop on
“Improvement of solid waste
management and reduction of GHG
emissions in Asia (SWGGA)”

Masato YAMADA, NIES, Japan

Objective

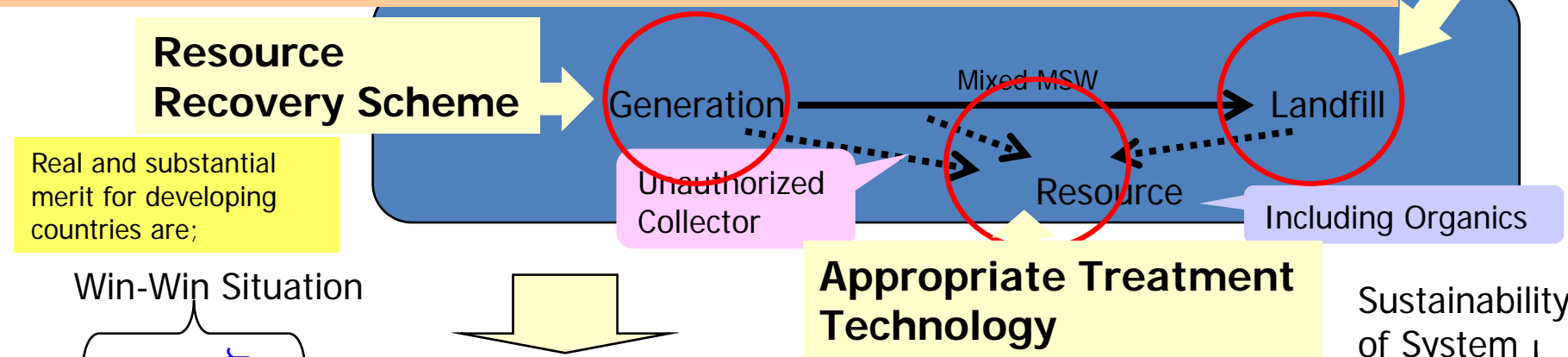
- To understand the effect of the improvement of waste management system on GHGs emission
- To discuss issues on sustainability on waste management
 - To share a common understanding of the current situation of waste management in Asian region
 - To improve the GHGs emission inventory for the waste sector
 - To draw the roadmap to both of the improvement of waste management and GHGs reduction

Co-benefit in Waste Stream Management

Future economic development will change the level of applicable technologies.

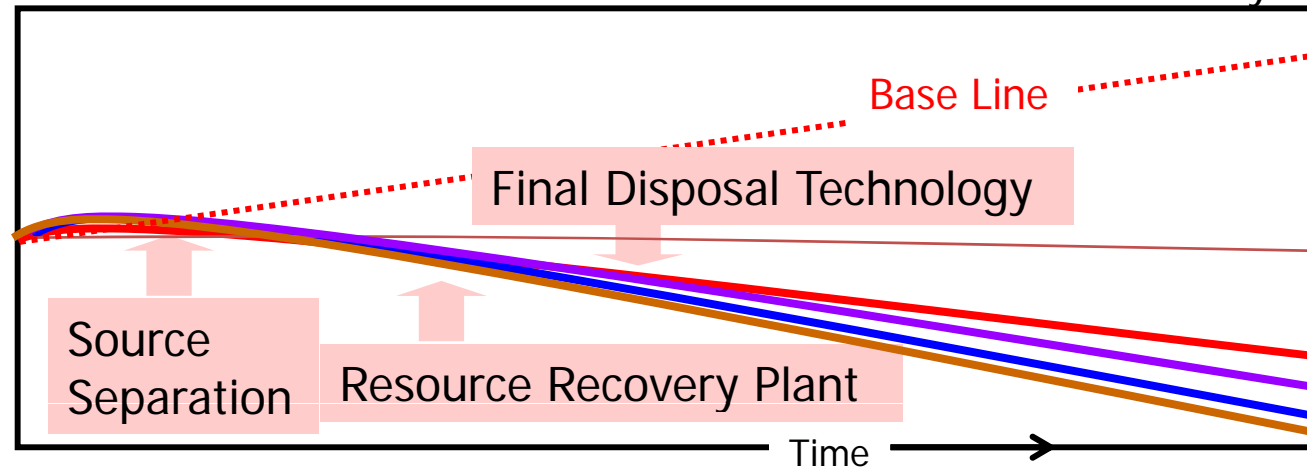
Final Disposal Technology

Stepwise Introducing of Scheme/Technology appropriate to Host Countries



Win-Win Situation

Disposal Mass
Disposal Hazardous Materials
Load to water and air
GHGs Emission



@ Development of New Procedure on Reduction of GHGs Emission by Improvement of Waste Stream Management, not only by Introducing New on site Plants.

Effective Investment and self sustained management

Quantification of Win-Win Benefit from CDM project

Participants

- **Vietnam:** Prof. Cao The Ha (Vietnam National Univ.)
- **Korea:** Prof. Lee, Dong-Hoon (The Univ. of Seoul)
- **China:** Prof. Wang Qi (CRAES), Dr. Huang Zechun (CRAES), Dr. Quan Hao (SJC), Dr. Wen Xuefng (SJC)
- **Thailand:** Prof. Sirintornthep TOWPRAYOON (KMUTT), Prof. Chart Chiemchaisri (Kasetsart Univ.)
- **Mongolia:** Dr. Bulgamaa Densambu (Agricultural Univ. in Darkhan) :
- **Indonesia:** Ms. Upik S Aslia Kamil (MOE)
- **Malaysia:** Ms. Ellyza Mastura Aahmad Hanipiah (National Solid Waste Management Dept.)

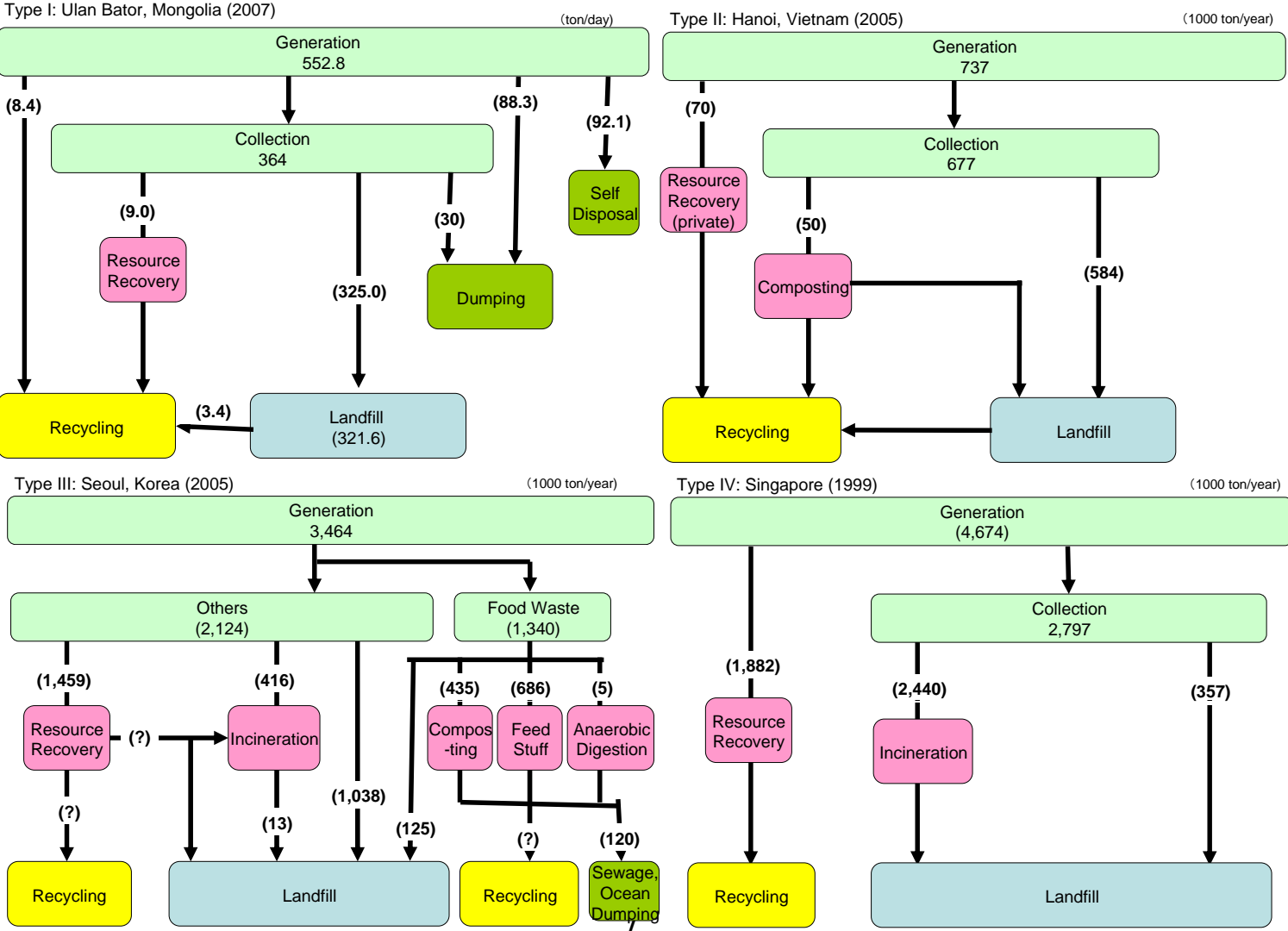


The 1st workshop on “Improvement of solid waste management and reduction of GHG emissions in Asia (SWGA)” on 18, January 2007 at Yokohama.

Discussion

- **About Status of Waste Management in Asia**
 - Overall, waste is increasing in many countries, except BKK where waste decreased
 - Big cities vs. Other areas
 - Generation, composition, management of waste
 - Different status of waste management
 - Countries try to improve situations (e.g., New facilities in Beijing; Separation in Hanoi), but not so easy
 - 3R, materializing, etc. have considerable rooms for improvement
 - Open dumping, improper landfills
 - Waste pickers or recyclers as part of waste stream
 - CDM projects: a large number in China, a few in others (yet to be registered)
 - **How to measure the amount of waste?**
 - Not all types of waste is covered (e.g., informal collection not included).

Solid Waste Stream in Asia



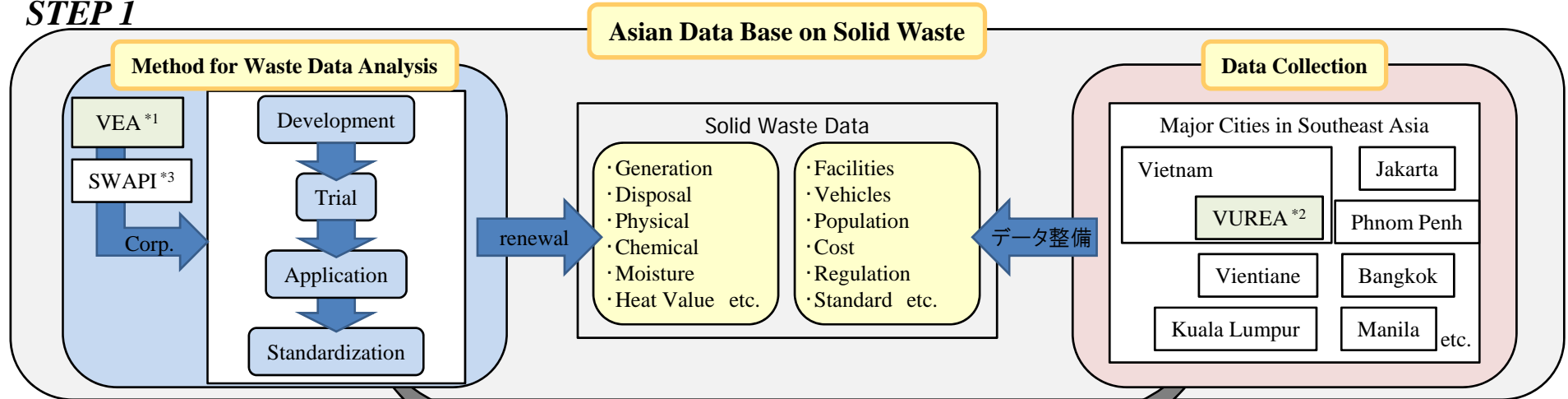


The 2nd workshop on "Improvement of solid waste management and reduction of GHG emissions in Asia (SWGA)" on 25-27 Feb 2008 at Fukuoka.

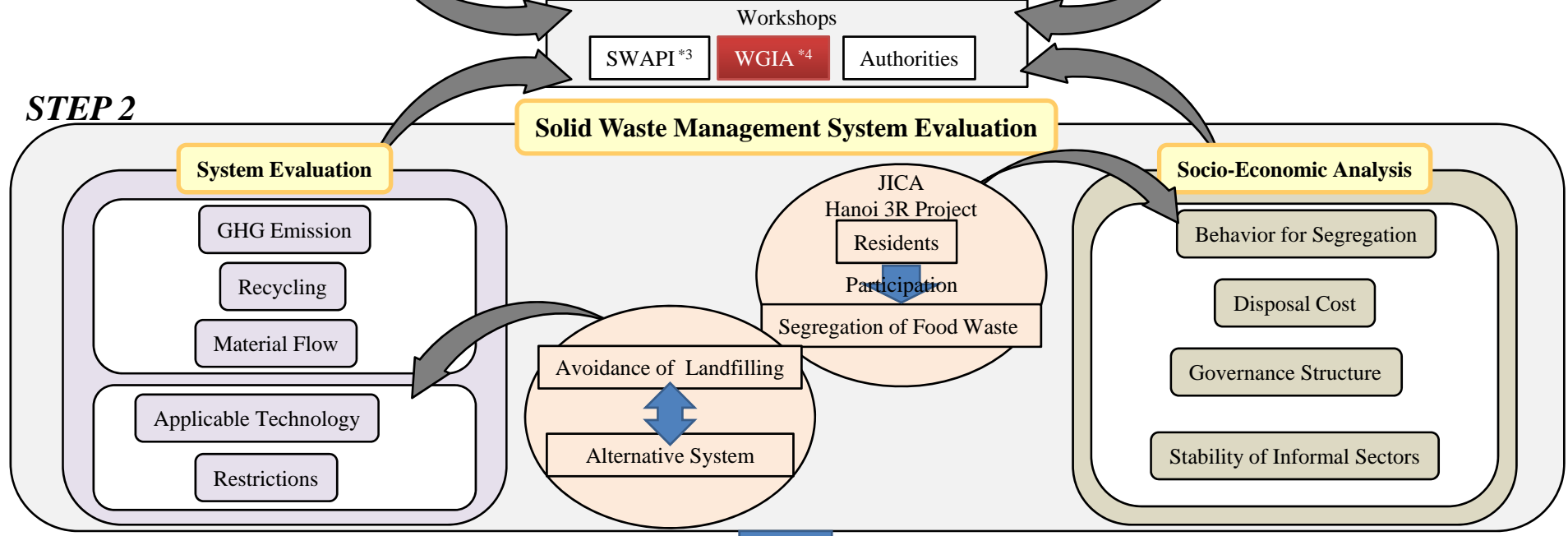
Discussion

- **How to make reliable waste data?**
 - Procedure/ Manual/ Standard Methodology
 - Statistical reliability/ Accuracy: Money + time consuming
 - Not Best but **Better Std Method** (tolerable)
 - Optimize/ adjust to **IPCC data platform**
 - Difficulties on k-value (Asian country-specific)
 - Categorize technology on parameter
 - National base material flow analysis (MFA)

STEP 1



STEP 2

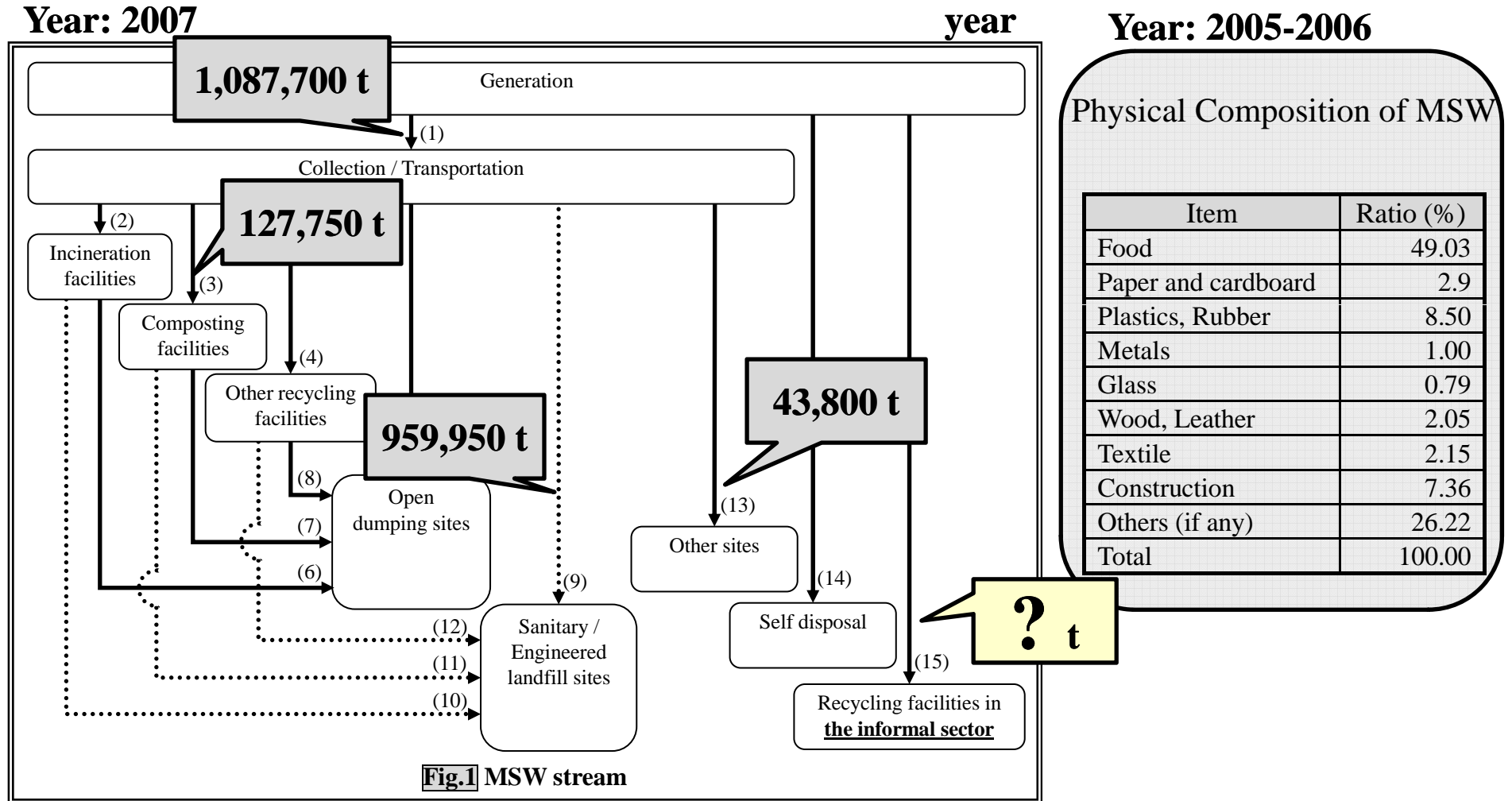


*1 Vietnam Environment Administration
 *2 Vietnam Urban Environment Association
 *3 Society of Solid Waste Management Experts in Asia and Pacific Islands
 *4 Workshops on Greenhouse Gas (GHG) Inventories in Asia Region

Hanoi City

Respondent: Hanoi Urban Environment Limited Company (URENCO)

Population under Waste Collection: 3,289,300 (Coverage 100%)

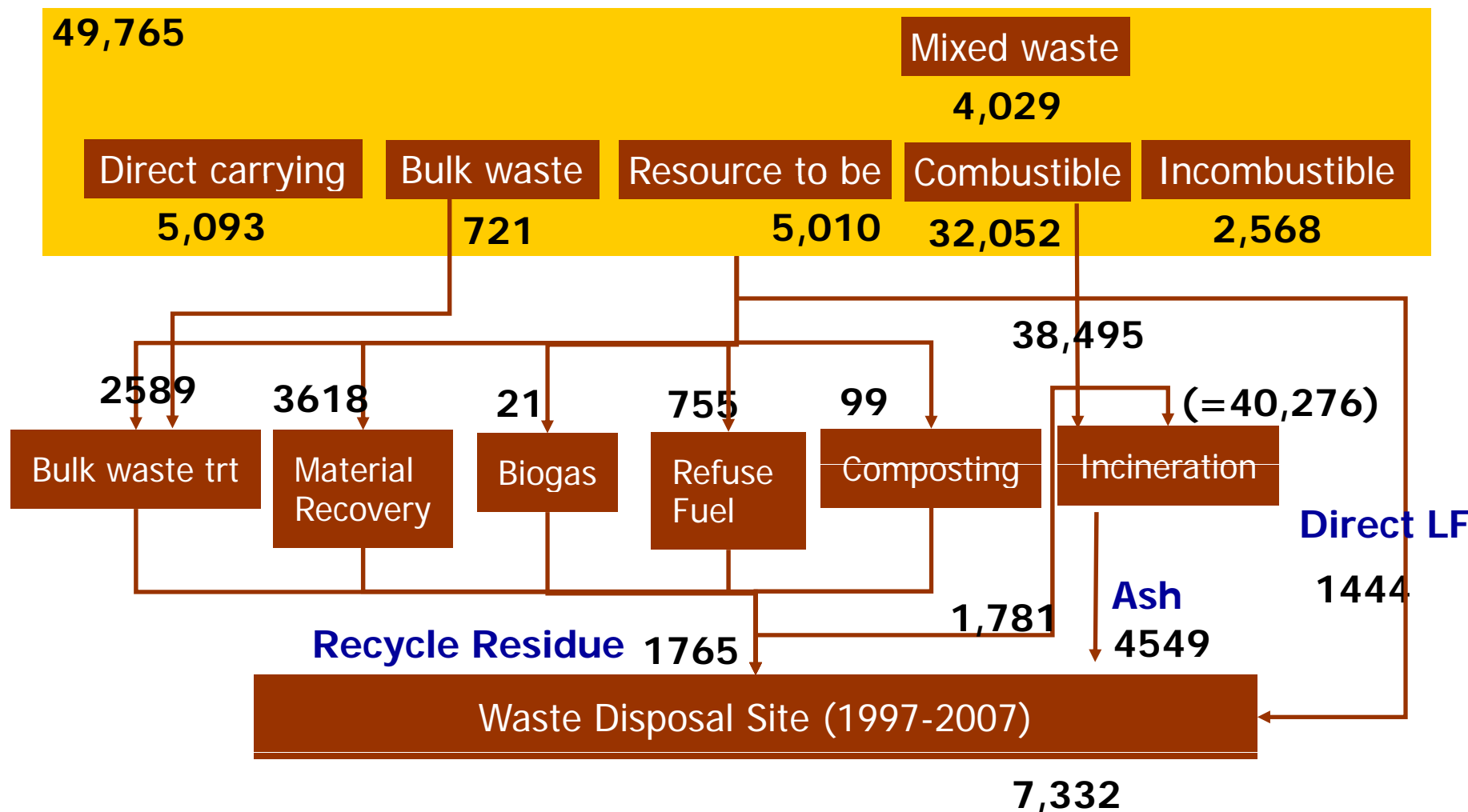


Discussion

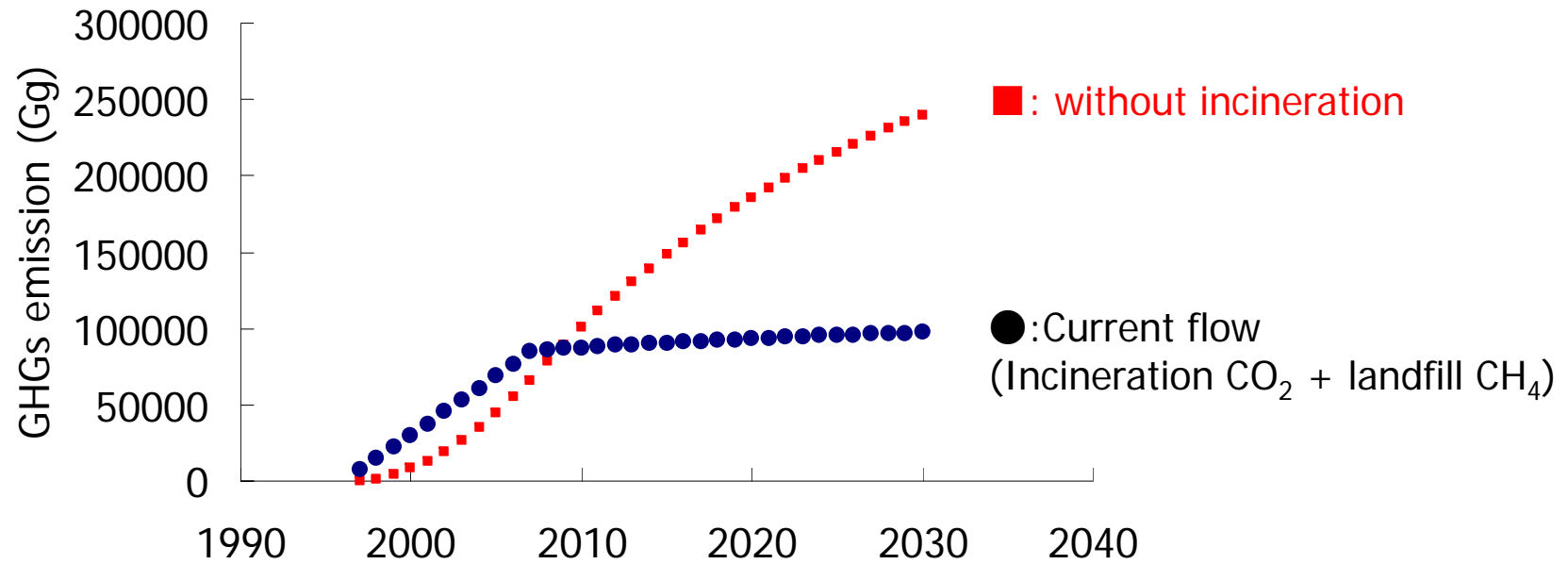
- **About “Appropriate tech.”**
 - Rival (opposite?) technology
 - **example.** Semi-aerobic vs LFG to energy
 - Combination ; Go Together
 - Operating (active) or Closed LF, Scale (Size)
 - Appropriate combination/management
 - Order? Management definition?
 - **Need of Asian strategy on landfill management**
 - Reconsider to reduce GHGs, **Priority** ?

MSW flow in JAPAN

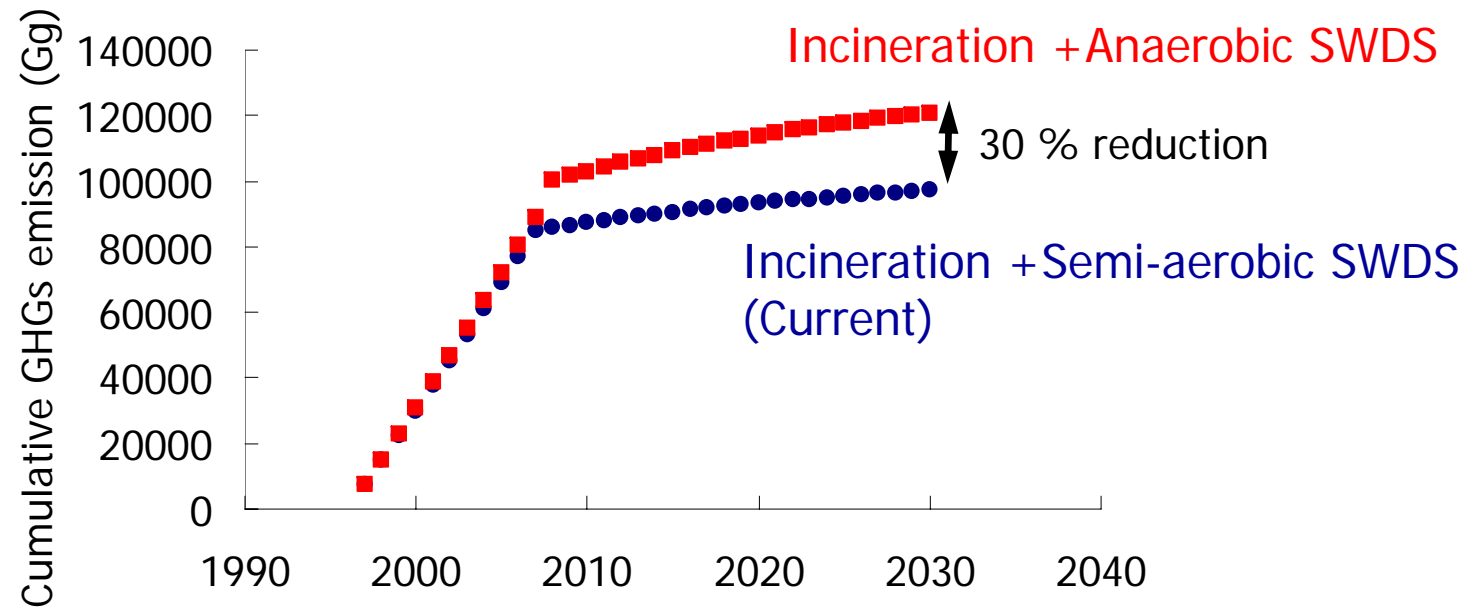
thousand ton



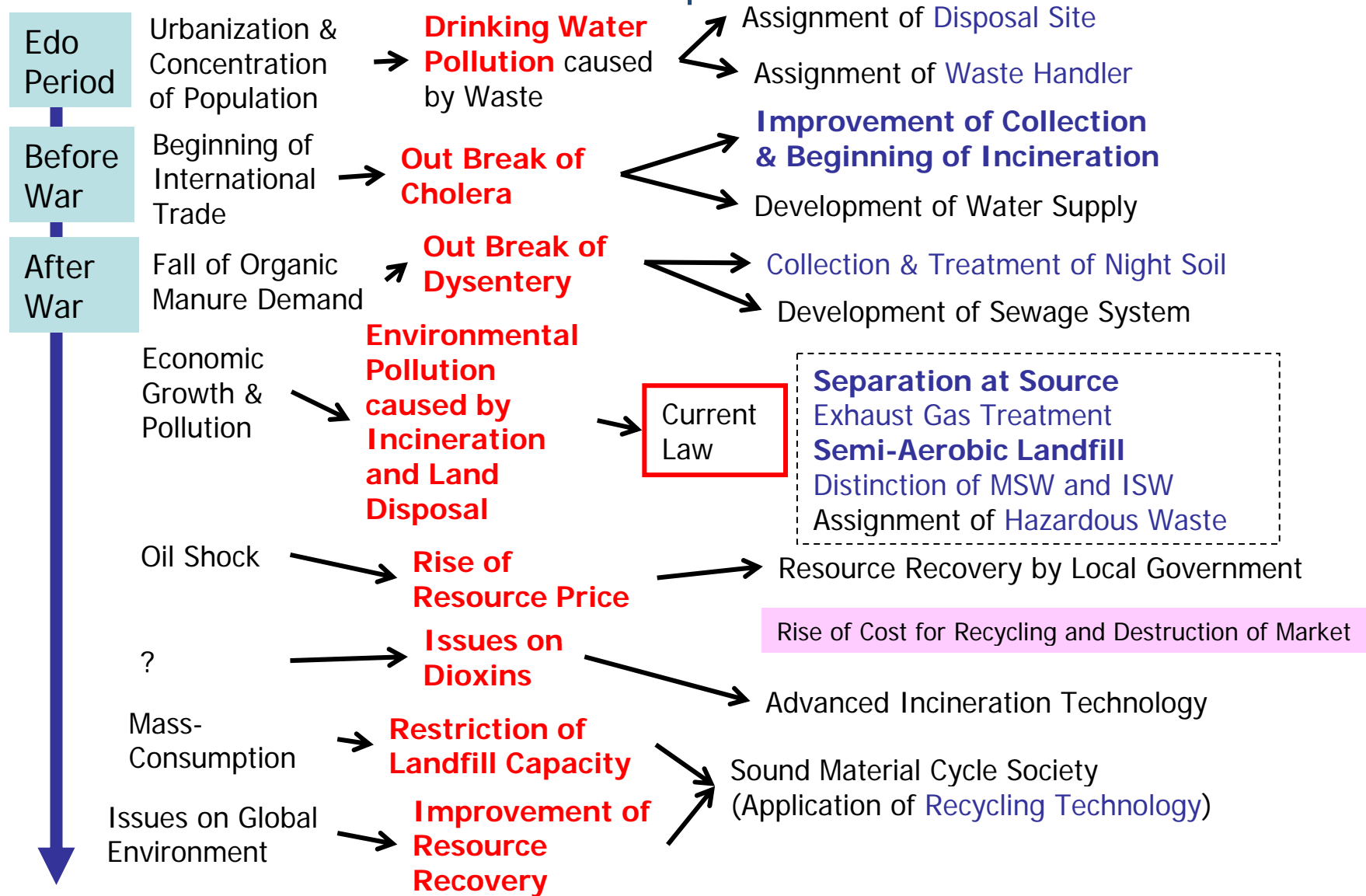
Effect of Incineration



Effect of semi-aerobic landfill



History of Waste Management in Japan





The 3rd workshop on "Improvement of solid waste management and reduction of GHG emissions in Asia (SWGA)" on 18-20 Feb 2009 at Kyoto.

Discussion

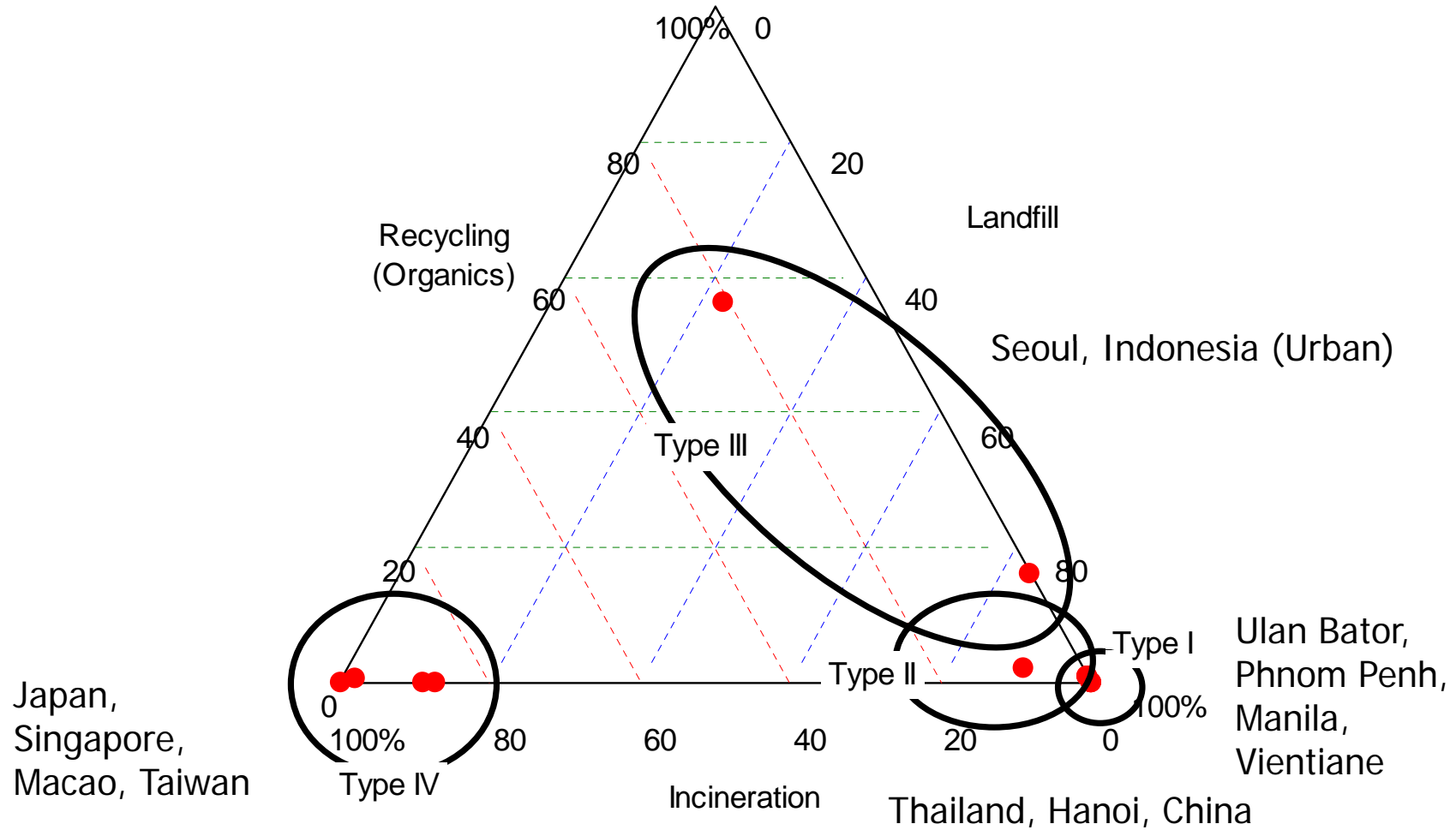
- **About Upstream Solid Waste Management**
 - Importance of **Education** and **Public awareness**
 - **Economical incentives**
 - Charging system for food waste
 - Marketing value (& benefit) of source separation
 - special collection service, How collect, How transport
 - Business creation, involvement of municipality, Activity of informal picker, scavenger, resource buyer
 - Development of **downstream**
 - technology on treatment, transportation, storage should be needed with source separation
 - Effective measures in each country?
 - And How to Approach
 - **Start from Local government** under their own specific circumstances
 - **1st Education**, participation, **2nd Incentives**, **3rd punishment**
 - **Simultaneous development** of education and punishment for encouraging people
 - Source separation would have educational effect
 - Education/ Advertisement with several channels

Discussion

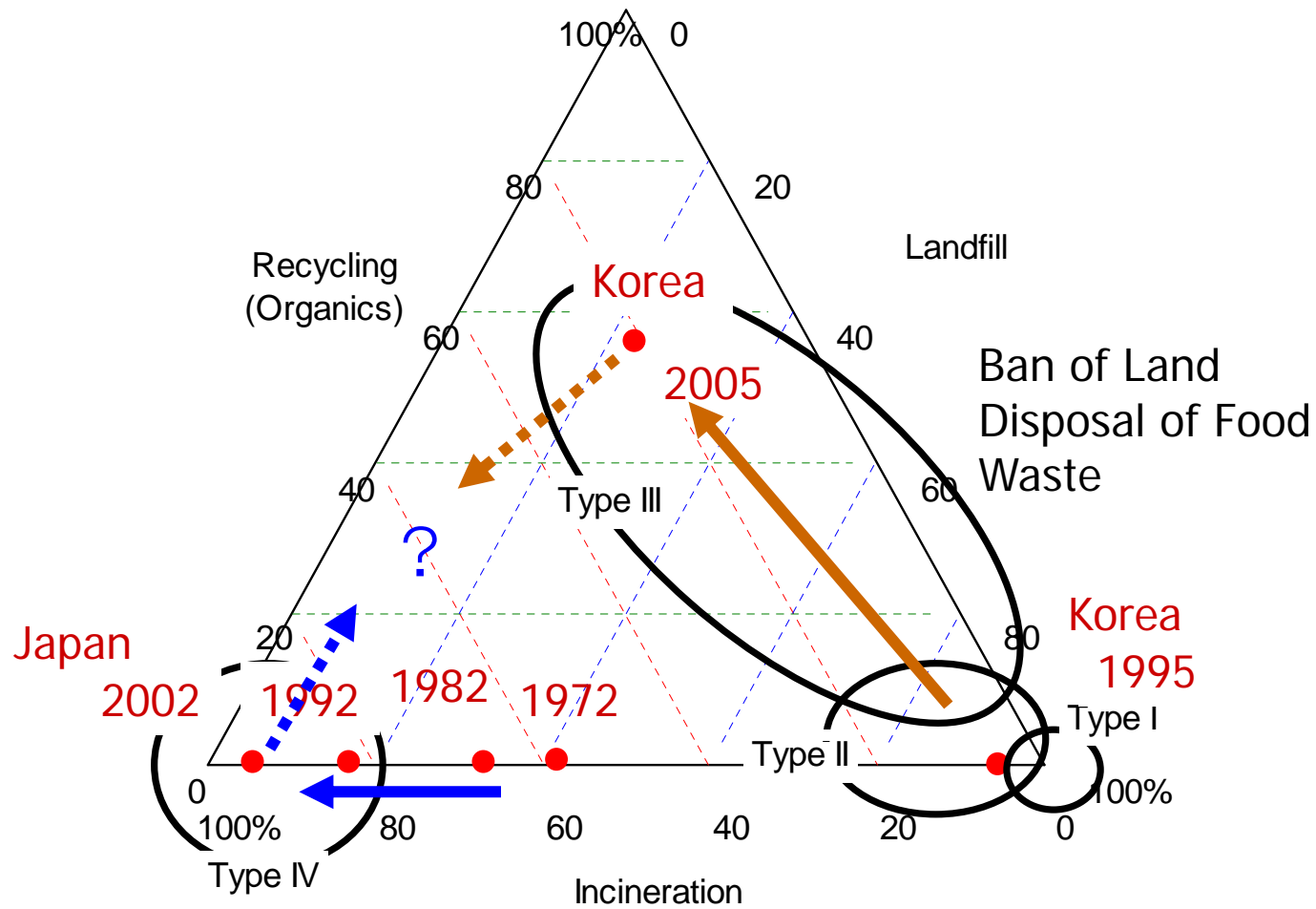
- **About Sustainability of Waste Management**

- Zero emission (ex.ZOL: zero organic to landfill, ZGE: zero greenhouse gas emission, ZDW: zero discharge waste water from waste) is one of the target for sustainable WM.
- How to achieve the sustainability is different in each countries and regions.
- Indicator for sustainable WM must be defined for Asian countries.
- Barriers: economy, social, culture, technology
- Important to realize the weak point in each countries
- WM could be include the part of sustainable society (economic)

Transition of Waste Management



Transition of Waste Management



Conclusion

- Reliable waste data is still the major issue both on waste management and GHG reduction in Asia.
- Waste management in each Asian country/city has been established in their circumstances.
- Understanding of similarity and difference of waste stream and disposal technology in Asian countries should be essential to improvement both of waste management and GHG reduction.
- Then collaboration between Asian countries will lead better waste management and GHG inventory.



Thank you for your attention!

Next SWGA will be held as a
Seminar on Dec 2009 or Jan
2010 in Thailand