Fifth Regional 3R Forum in Asia and the Pacific, 25-27 February 2014, Surabaya

Science Community Cooperation with Policy and Business Model Development in the Fields of 3Rs and Waste Management

Shinichi Sakai

Kyoto University

Science Community Cooperation with Policy and Business Model Development in the Fields of 3Rs and Waste Management

1. Science-based Developments in Policy and Business Fields
2. Science Communities and Activities in Asian region
3. Regional Cooperation as an Example, 3R International Scientific Conference (3RINCS)

1. Science-based Developments in Policy and Business Fields

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Material Cycles &
Waste Management

Hierarchy of Waste Management: 3R, "Reduce, Reuse, and Recycling"

- With the development and spread of the waste management policy,
  Hierarchical priority is given to "reduce, reuse, recycling, treatment and final disposal" in this order. We call the first three measures of 3R, "Reduce, Reuse, and Recycling".

- The idea of hierarchy is regarded as the basis on regulations, policy discussions and voluntary plans.

Integration of Solid Waste Management

- **Hierarchical Measures are not sufficient.**

  The reasons are:

  1. **We cannot stop the use of all products.**
     (Limit of Reduce)
  2. **Recycled products are not eternal.**
     (Limit of Reuse)
  3. **Reproduced materials deteriorate.**
     (Limit of Reproduced Cascade Recycling)
  4. **Residual measures are necessary even if waste incineration is used to generate energy**
     (Limit of Treatment with Energy Recovery)
  5. **Next generation has the potential to pay the bill for landfills and storage.**
     (Limit of Final Disposal)

  Integrated approach is also important.

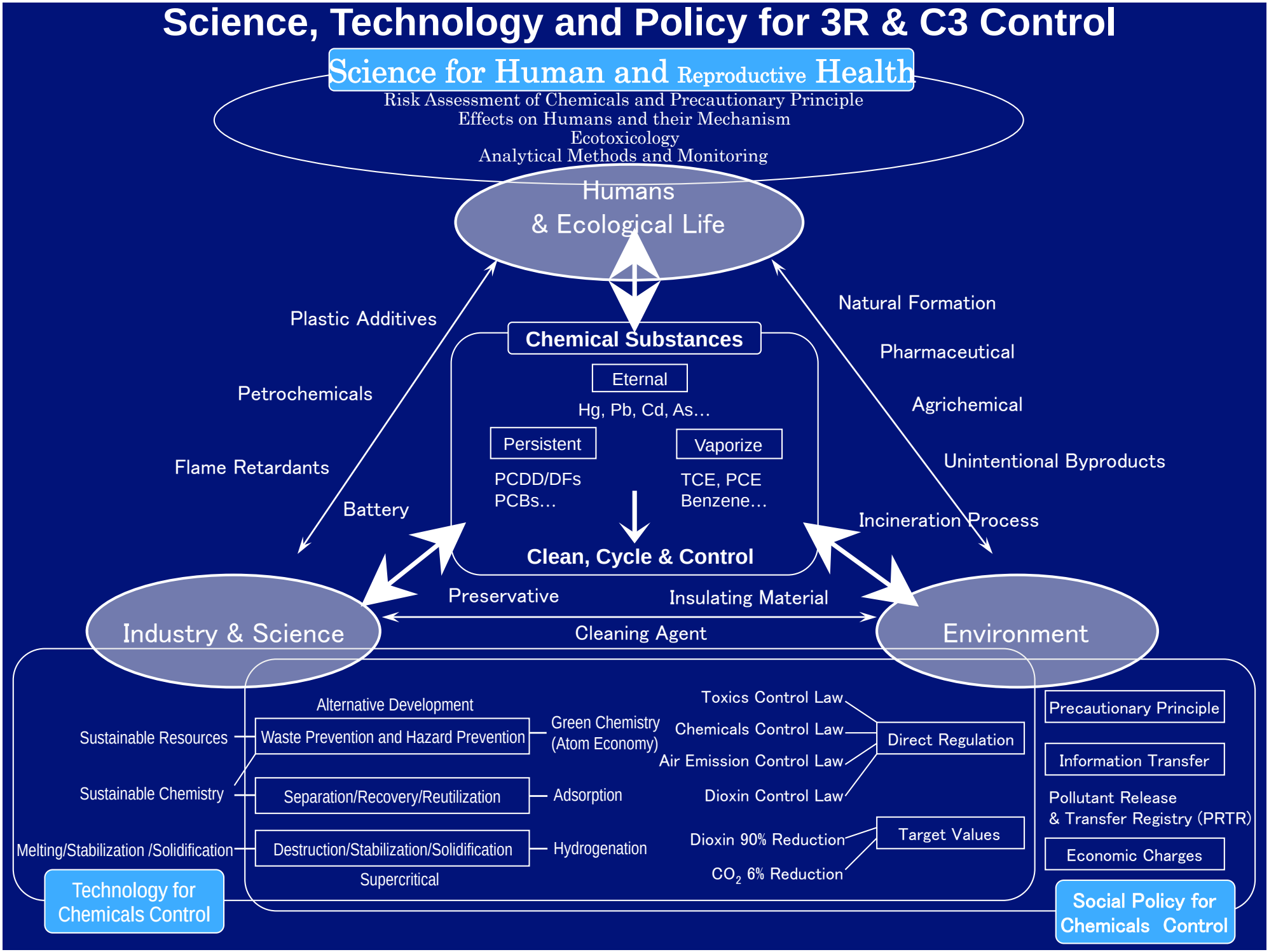
“Clean/ Cycle/ Control”, 3C Concept

- Basic concept for technologies and society systems with the control of hazardous wastes and persistent chemicals
- Avoid the use of hazardous chemicals and the use of alternatives. （Clean）
- In case there is no appropriate alternative substances and the use of specified material is essential because of its crucial effect, recycling should be the principle. （Cycle）
- Emission control to the environment, and the decomposition and stabilization of stock substances and wastes which have been used in the past. （Control）

Sakai, S. Environ. Sci. & Pollut. Res. 7(4) 225-232 (2000)

Towards the Establishment of a Cycle-Oriented Society and Chemical Substances Control

*We have no choice except pursuing these two ways to save livings and this planet.


Science, Technology and Policy for 3R & C3 Control
Science for Human and Reproductive Health
Risk Assessment of Chemicals and Precautionary Principle
Effects on Humans and their Mechanism
Ecotoxicology
Analytical Methods and Monitoring
Humans
& Ecological Life
Plastic Additives
Petrochemicals
Flame Retardants
Battery
Natural Formation
Pharmaceutical
Agrichemical
Unintentional Byproducts
Incineration Process
Chemical Substances
Eternal
Hg, Pb, Cd, As…
Persistent
PCDD/DFs
PCBs…
Vaporize
TCE, PCE
Benzene…
Clean, Cycle & Control
Preservative
Insulating Material
Cleaning Agent
Industry & Science
Environment
Alternative Development
Sustainable Resources
Waste Prevention and Hazard Prevention
Green Chemistry
(Atom Economy)
Sustainable Chemistry
Separation/Recovery/Reutilization
Adsorption
Melting/Stabilization /Solidification
Destruction/Stabilization/Solidification
Hydrogenation
Supercritical
Technology for
Chemicals Control
Toxics Control Law
Chemicals Control Law
Air Emission Control Law
Dioxin Control Law
Direct Regulation
Dioxin 90% Reduction
CO_2 6% Reduction
Target Values
Precautionary Principle
Information Transfer
Pollutant Release
& Transfer Registry (PRTR)
Economic Charges
Social Policy for
Chemicals Control

Examples of the Expected Science-based Policies for 3R Activities/ Promotion

1. Reduction: **Life-cycle effect** of food loss reduction on energy & GHG emission
2. Recycling: Available metal potential and technologies by recycling metals from E-waste/ELVs by **substance flow analysis**
3. Waste Management: Regulations for POPs & heavy metals, and their effectiveness
   - **Dioxin Control**: Measurement of dioxins in environmental media and human body, and their transport phenomena in local and global scales
   - **PCB Decomposition**: Development of PCB destruction technologies & verification of their effects on environmental load

2. Science Communities and Activities in Asian region

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Material Cycles &
Waste Management

The 30th anniversary of KSWM in 2013

- **Korean Society of Waste Management (KSWM) was founded in 1983 and is holding a special annual meeting at Jeju International Convention Center on November 14- 16, 2013.**
- **Sincere congratulation on the 30th anniversary of KSWM to all KSWM members on behalf of the members of JSMCWM and am very proud of attending the celebration meeting of KSWM together.**

Korea Society of Waste Management

History of the Japan Society of Material Cycles and Waste Management (JSMCWM)

- JSMCWM was established in March 27, 1990
- The purpose is to have academic contributions of developments of proper waste management and recycling activities through the academic researches and their information exchanges
- Members in 1990
  - Individuals: 1222, Students: 3, Supporting: 143, Public: 54
- Members in 2009
  - Individuals: 2811, Students: 256,
  - Supporting: 129 Public: 97, Citizens Groups: 7

Steps of JSWME from 2009

1. **Rename: Japan Society of Material Cycles and Waste Management（資源循環廃棄物学会）**
2. **To get the Public Interest Corporation**
   - Easy to Get an Official Research Fund
3. **Corporation with Asian and Pacific Experts**
   - Cooperated Journal Editing Work with KSWM (Korean Society of Waste Management) from April, 2009
   - Special Issue on “Solid Waste Management in Asia and Pacific Islands” in 11[2], 2009

   http://www.springerlink.com/content/110360/

Main Activities of JSMCWM

1. Journal Publication
2. International Exchange
3. Conference
4. Research and Development
5. Symposiums, forums, open lectures and technical visits

Web (in Japanese)： http://jsmcwm.or.jp/
Web (in English)： http://jsmcwm.or.jp/international/

Journal of Material Cycles and Waste Management (JMCWM)

- First issue was published in 1999 as an academic international journal of Springer-Verlag Tokyo edited by JSMCWM
- JMCWM has been followed by quarterly publication
- JMCWM has been registered in the Web of Science, and SCI (Scientific Citation Index) was also given in 2010.
- Electric submission and reviewing system has started in 2011

3. Regional Cooperation as an Example,

3R International Scientific Conference (3RINCs)

Material Cycles & Waste Management


Welcome to KYOTO
3R International
Scientific Conf.
3RINCs, 2013
http://3ri-2014.org
日本
3RINCS
Shin-ichi Sakai , Kyoto Univ.

3RINCs 2014

- 3R International Scientific Conference on Material Cycles and Waste Management

- **The Expert Meeting on Solid Waste Management in Asia and Pacific Islands (SWAPI) has been held every year since 2005 to establish regional cooperation aimed at improving solid waste management**
- **Each national academic society has long history**
  - Korean Society of Waste Management (KSWM): 30 years
  - Japan Society of Material Cycles and Waste Management (JSMCWM) : more than 20 years
- **3R International will act as a nucleus for the development of scientific activities in the 3R area as an open academic platform. We are calling for scientifically based presentations from all stakeholders.**

Organizers and Supporters

ORGANIZER: Japan Society of Material Cycles and Waste Management (JSMCWM)

CO-ORGANIZERS: Korean Society of Waste Management (KSWM), Society for Solid Waste, Chinese Society for Environmental Sciences (SSW-CSES) and other regional and global academic networks

SUPPORTERS: Ministry of the Environment Government of Japan, UNEP-IETC, UNCRD, JICA Kansai, IGES, Kyoto Prefecture, Kyoto City

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NIPPON STEEL & SUMIKIN ENGINEERING TAIHEIYO CEMENT TAKUMA TOWA Technology Corporation Hitz Hitachi Zosen plantec REMATEC

3RINCs Plenary Lectures

Japanese Challenges for Material Cycles and Waste Management (TBD)
Dr. R. Yatsu
Administrative Vice-Minister of the Environment of Japan

The Application of MFA/SFA for Decision Making in Resource and Waste Management
Prof. Dr. P. H. Brunner
Vienna University of Technology

Waste Management and Resource Recycling in Asia
Prof. Dr. P. Agamuthu
University of Malaya

Past, Present and Future of Waste Management in Korea
Prof. Dr. YC. Seo
Yonsei University, President of KSWM

Development and Policy of Solid Waste Treatment Industry in China
Prof. Dr. H. Hu
Ministry of Environmental Protection, Director of SSW-CSES

Integrated Approach for Sustainable Material Cycles and Waste Management
Prof. Dr. S. Sakai
Kyoto University

CALL FOR ABSTRACTS

3R International

The 3R International Scientific Conference on Material Cycles and Waste Management

and

SWAPI

13th Expert Meeting on Solid Waste Management in Asia and Pacific Islands

at Kyoto University
(Clock Tower Centennial Hall)

Kyoto, Japan, 10–12 March 2014

3R International Scientific Programs (Tentative)

- 3R (Reduce, Reuse, and Recycling) challenges
- Waste and recycling resource statistics and data collection and processing
- Municipal solid waste characterization and management
- Biomass waste utilization
- E-waste recycling and management
- ELV (end-of-life vehicle) recycling and management
- Construction and demolition waste
- Waste to energy･･･

Special Sessions in 3RINCs (2)

1. **3R Policy Issues in Asia and the Pacific** and Needs for **Scientific Cooperation** -Plastics in Coastal & Marine Environment by **UNCRD** (United Nations Centre for Regional Development)
2. **3R Indicator** in Asia and the Pacific by **IGES** (Institute for Global Environmental Strategies) & Asia Resource Circulation Policy Research Group
3. **Biomass Utilization Challenges** by **ASTEM** (Advanced Scientific Technology & Management Research Institute of KYOTO)

Special Sessions in 3RINCs (2)

4. **Disaster waste** & Japan's experience in **industrial waste management** by **UNEP-IETC** (United Nations Environment Programme/ International Environmental Technology Centre)
5. Appropriate **Leachate Management** in Tropical Asia by **Dr. Tomonori ISHIGAKI**, NIES (National Institute for Environmental Studies)

Venue: Kyoto University

Technical Tour (1)

- 12-13 March 2014, Okayama tour
- Eco System Okayama (ASR recycling plant)
- The biodiesel Okayama (Biodiesel plant)
- Eco System Sanyo (industrial waste disposal

Technical Tour (2)

- 13 March 2014, Kyoto tour
  - Kyoto city MSW incinerator
  - Kyoto city BDF plant

END

Thank you for your attention!