September, 2009

University of Rome

Development of Sustainability Science

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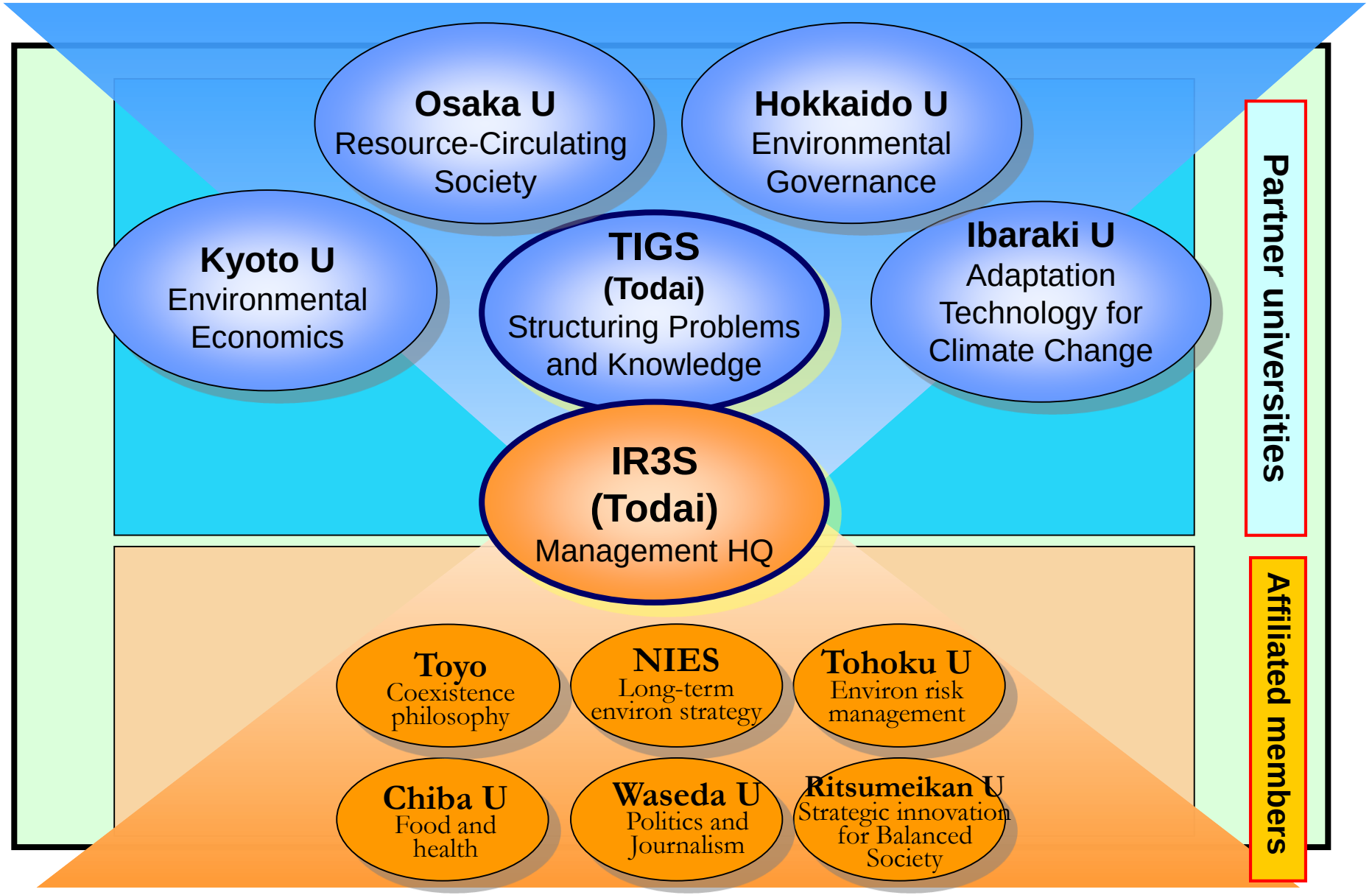
Integrated Research System for Sustainability Science (IR3S)



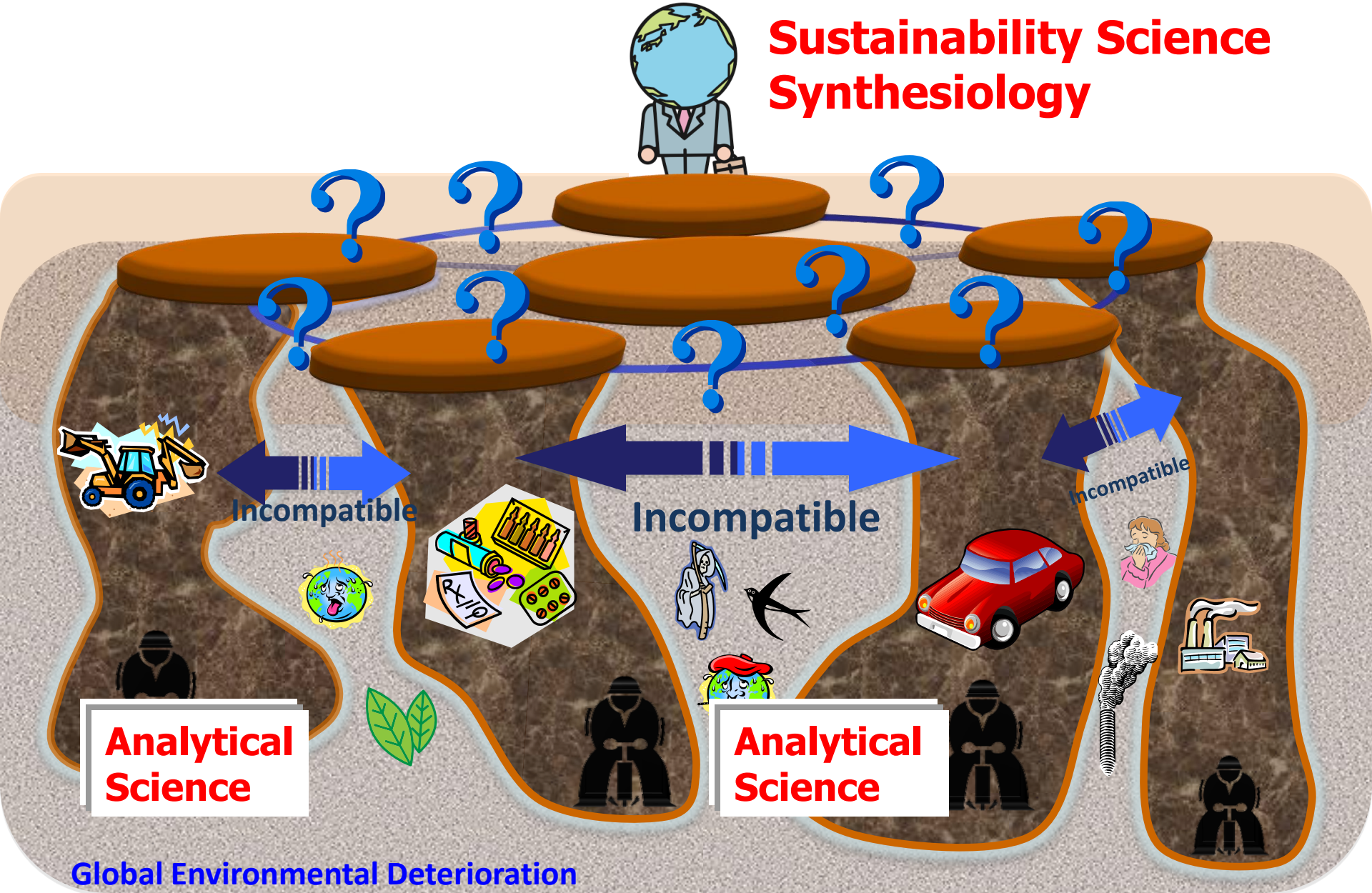
Sustainability is the Complex Issues


Prof. Hasumi, Former President, UT
AGS Annual Meeting, 2001
Lausanne)

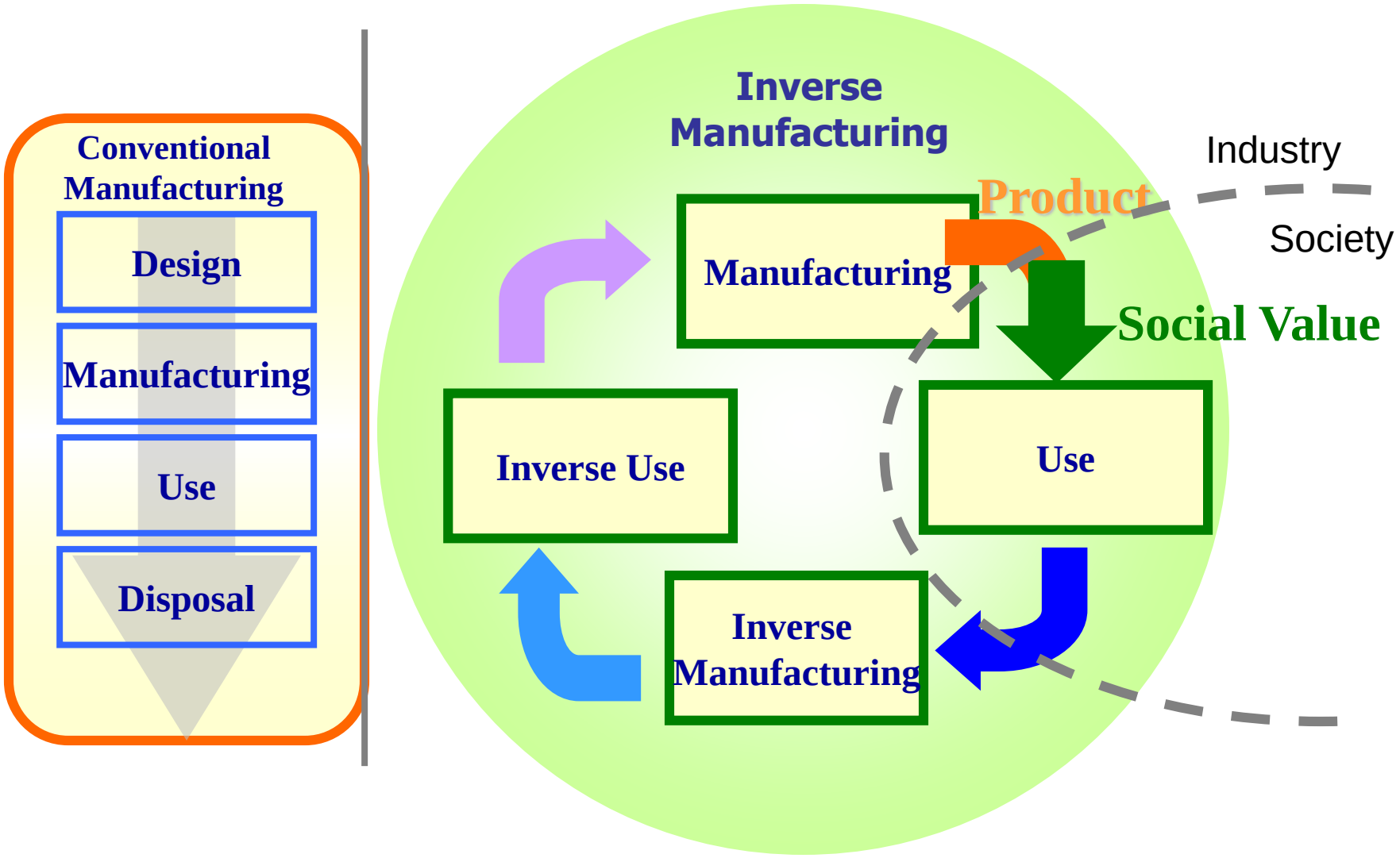
- ✓ The environment and "development" can coexist. This *complex* issues embraced by the *new concept* of "*sustainability*" cannot be explained by a single word "environment"
- ✓ Human stops thinking about a concept when it is *no longer new*.

We must constantly *renew* the concept of "*sustainability*", accept it in all its *complexity*, and resist simplifying its meaning.

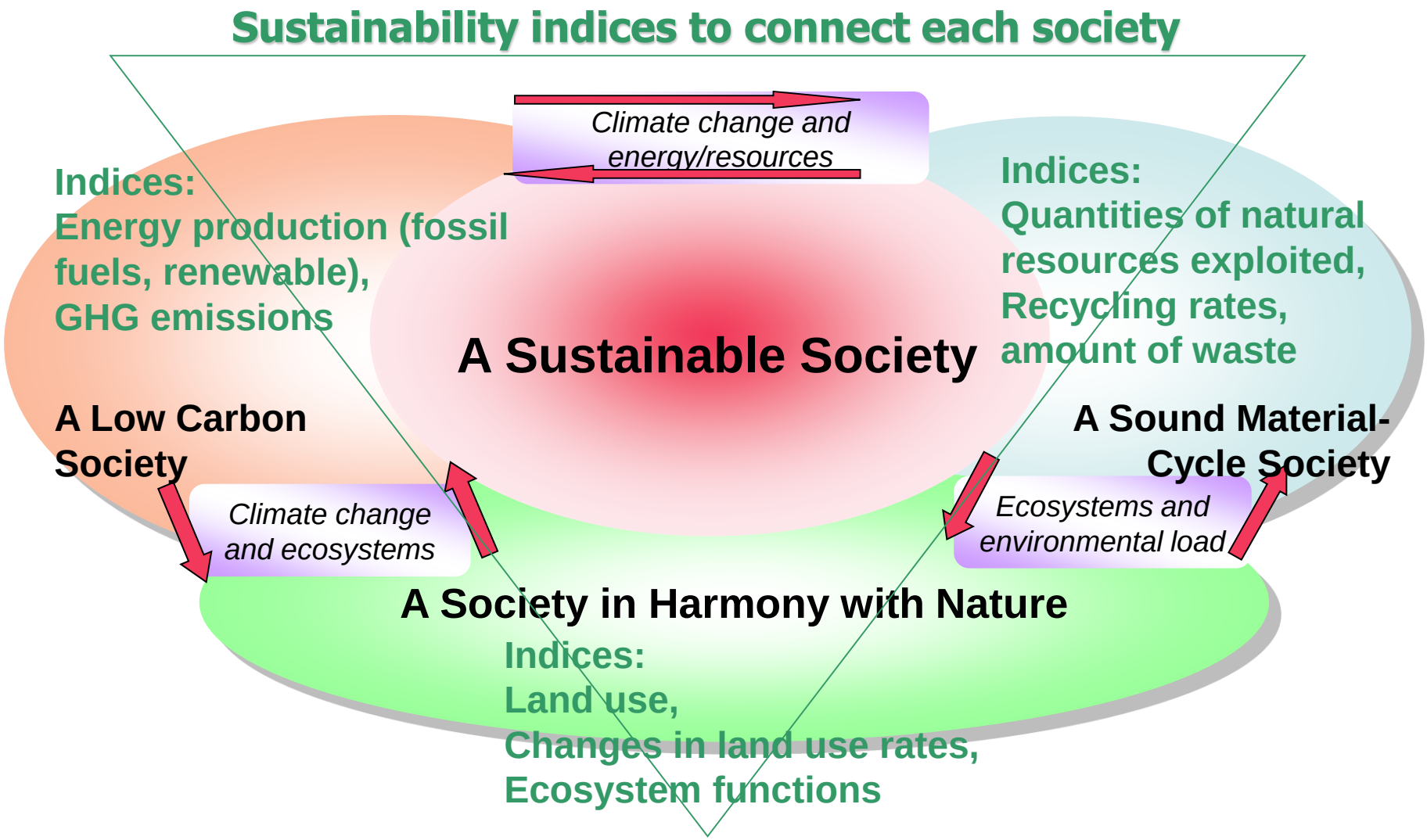
Creating Man-Made Environment that Matches Natural Environment



Inverse Manufacturing

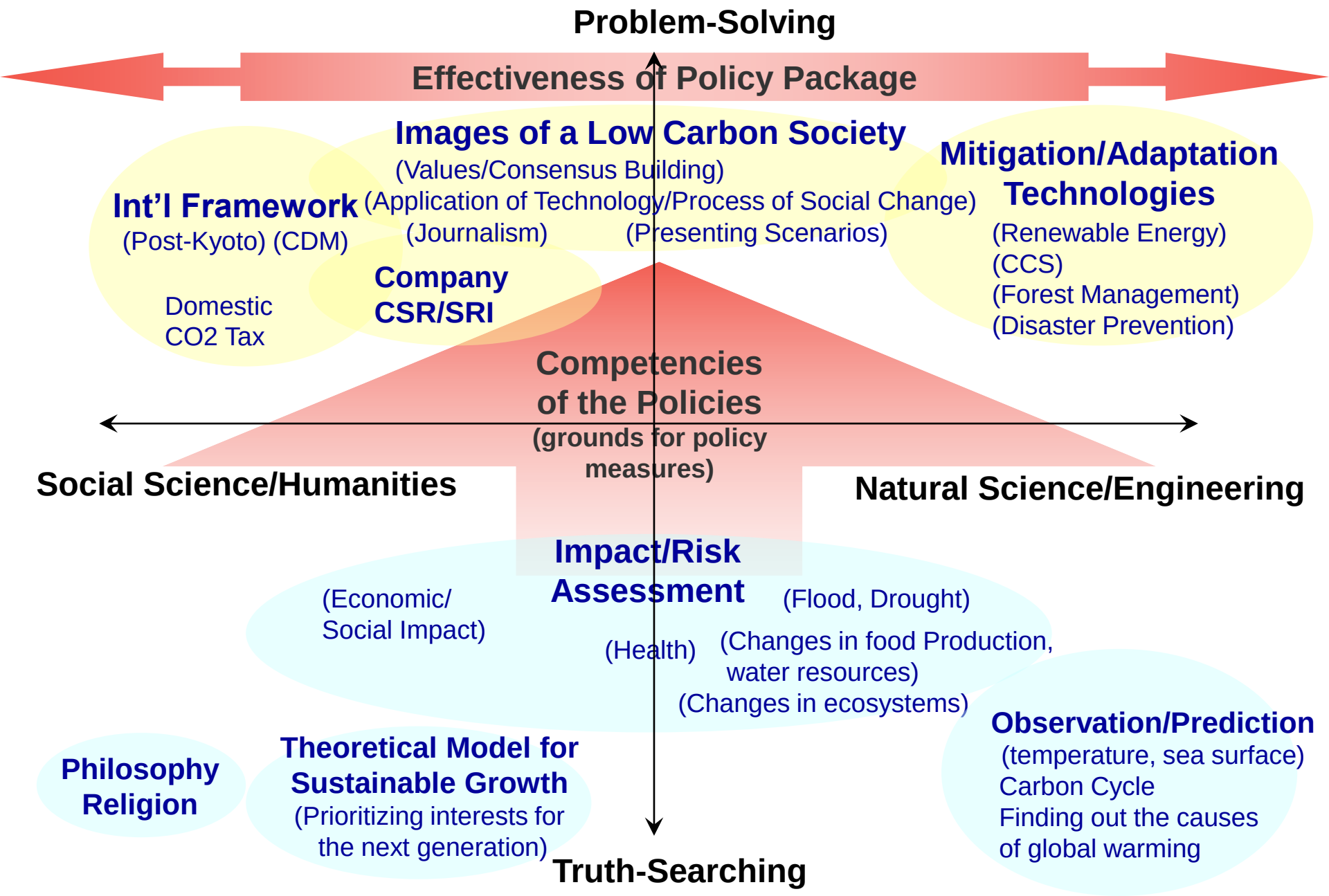


Research that integrates the Three Societies

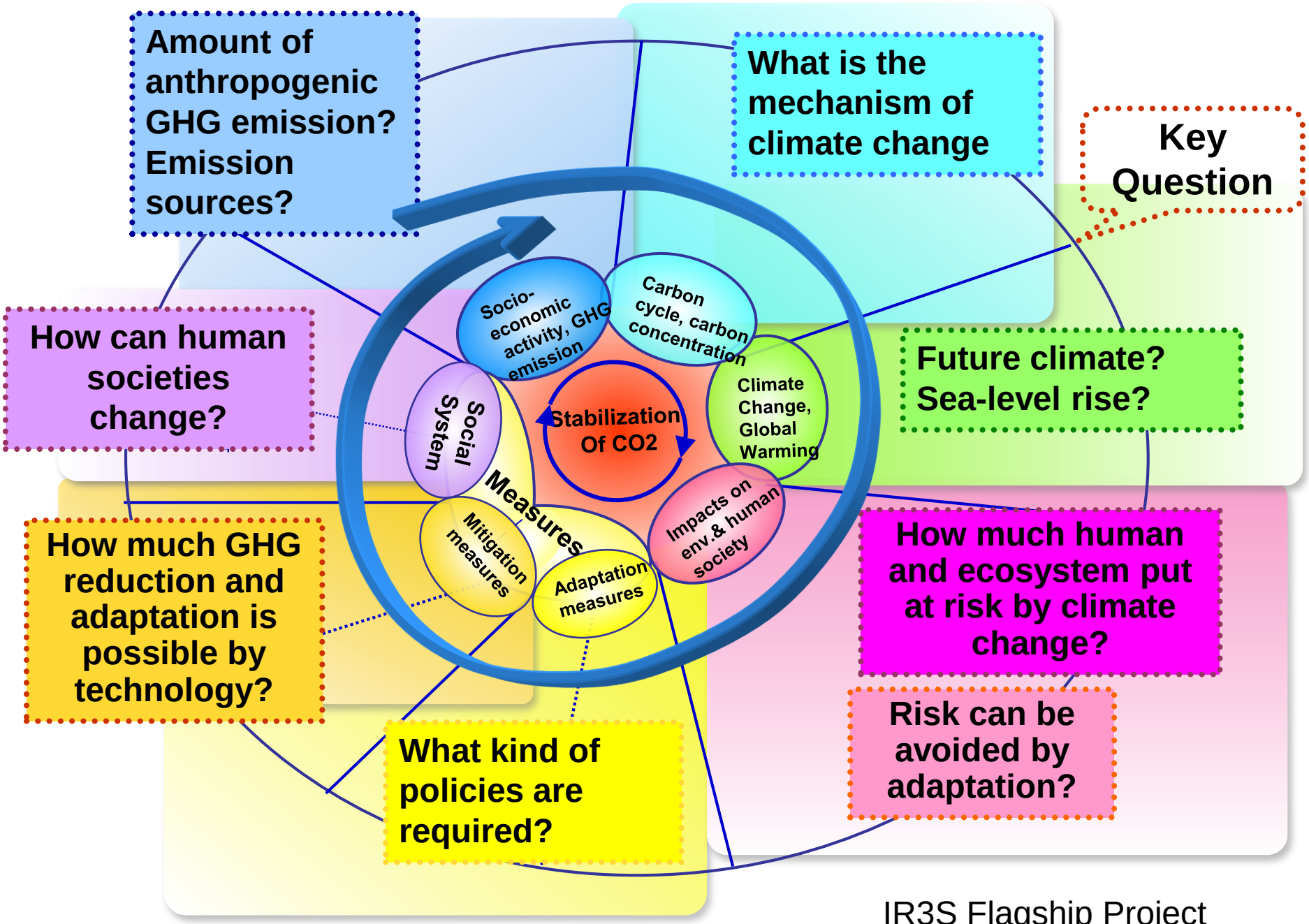


http://www.env.go.jp/en/focus/070606.html

Mapping of Climate Change and SD

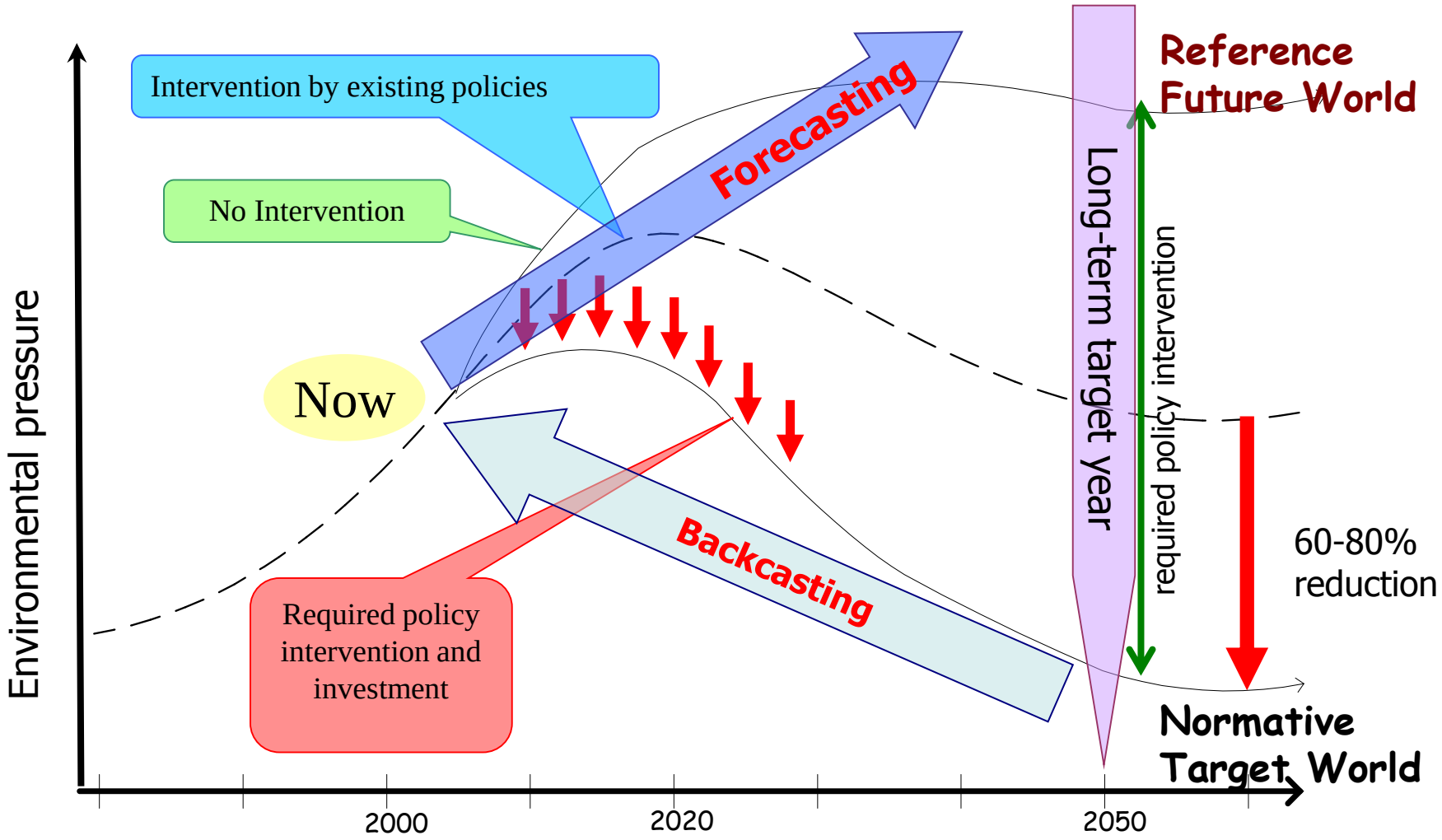


Key Questions for Mitigation and Adaptation



IR3S Flagship Project

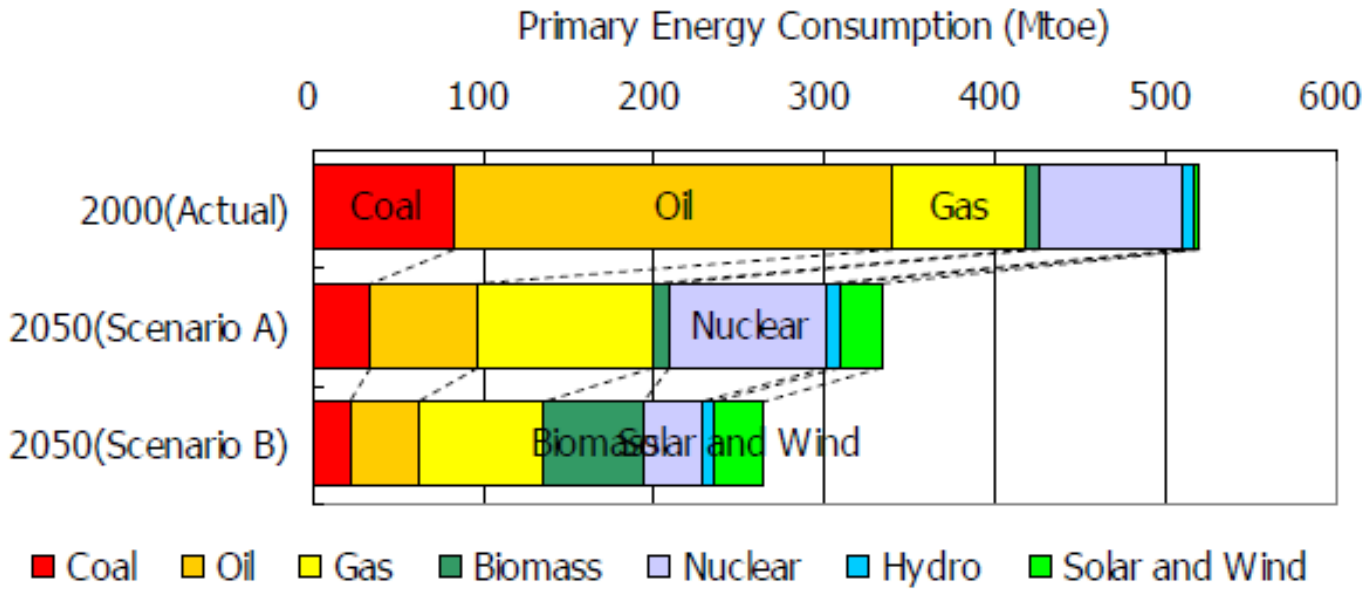
Back-Casting from Future Target World



From "*Low carbon society* scenarios towards 2050" project

Breakdown of Primary Energy Supply

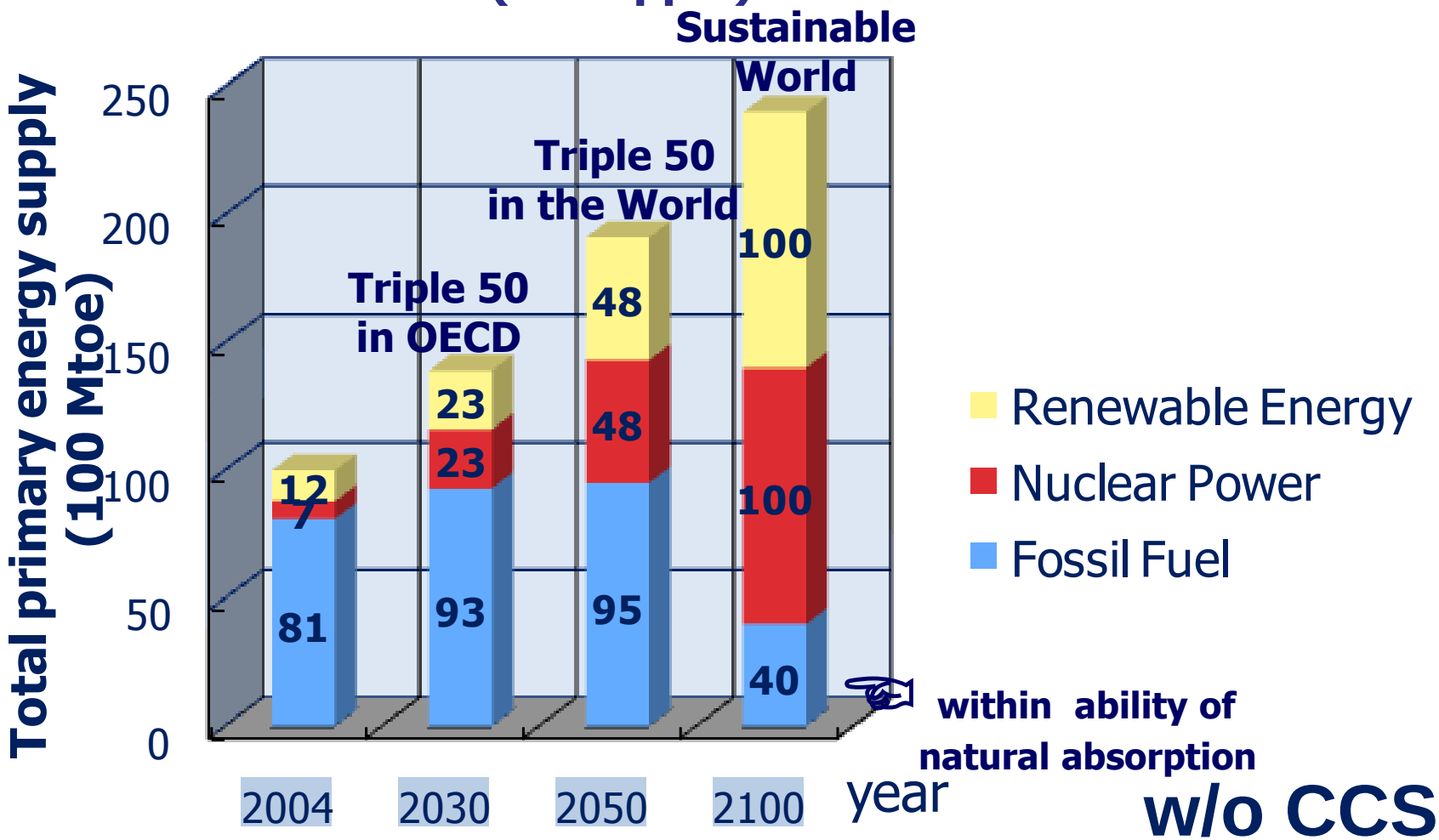
Primary energy supply



From "*Low carbon society* scenarios towards 2050" project

Sustainable Energy Mix Future

(<500ppm)



Triple50: 50% Self-sufficiency, 50% Dependency on Fossil fuel, 50% Energy efficiency

Sustainable = Emission of CO_2 within Earth ability of natural absorption

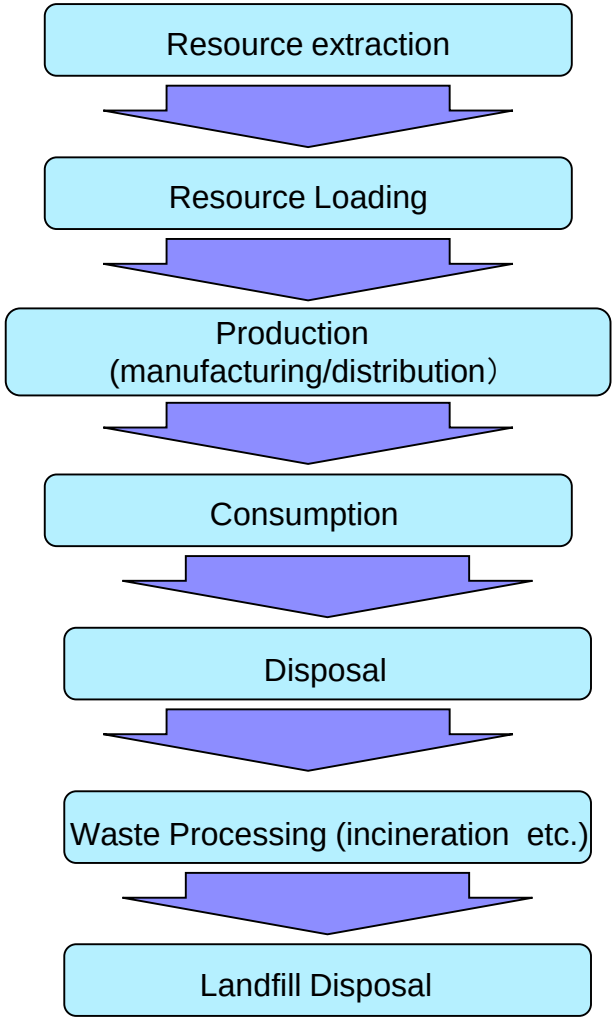
(exhausted with fossil fuel 4Btoe)

Proposed by T.YUHARA

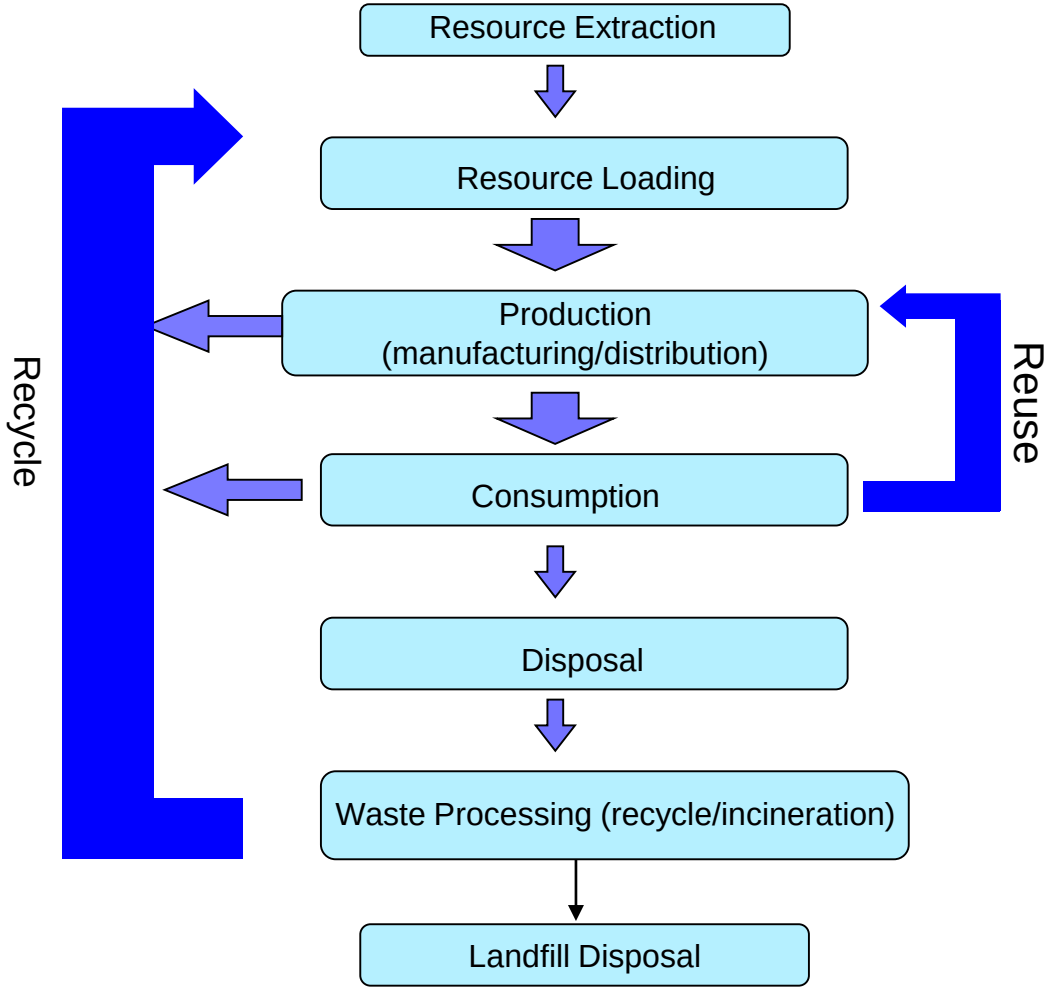
#3 Japan-China forum on environment, energy and transportation issues,Jan.2008

A Sound Material-Cycle Society

In a One-way based Society of mass production, mass consumption and mass disposal



In a Sound Material-Cycle Society
Promotion of 3R



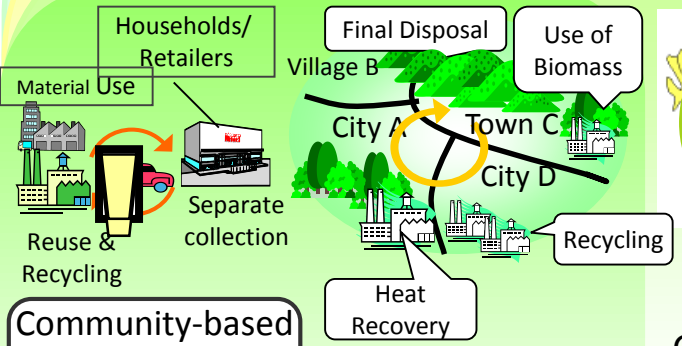
Spheres of Sound Material Cycle

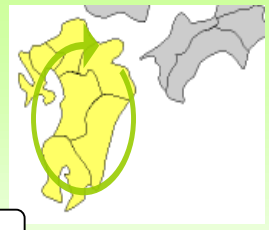
International Material Cycle

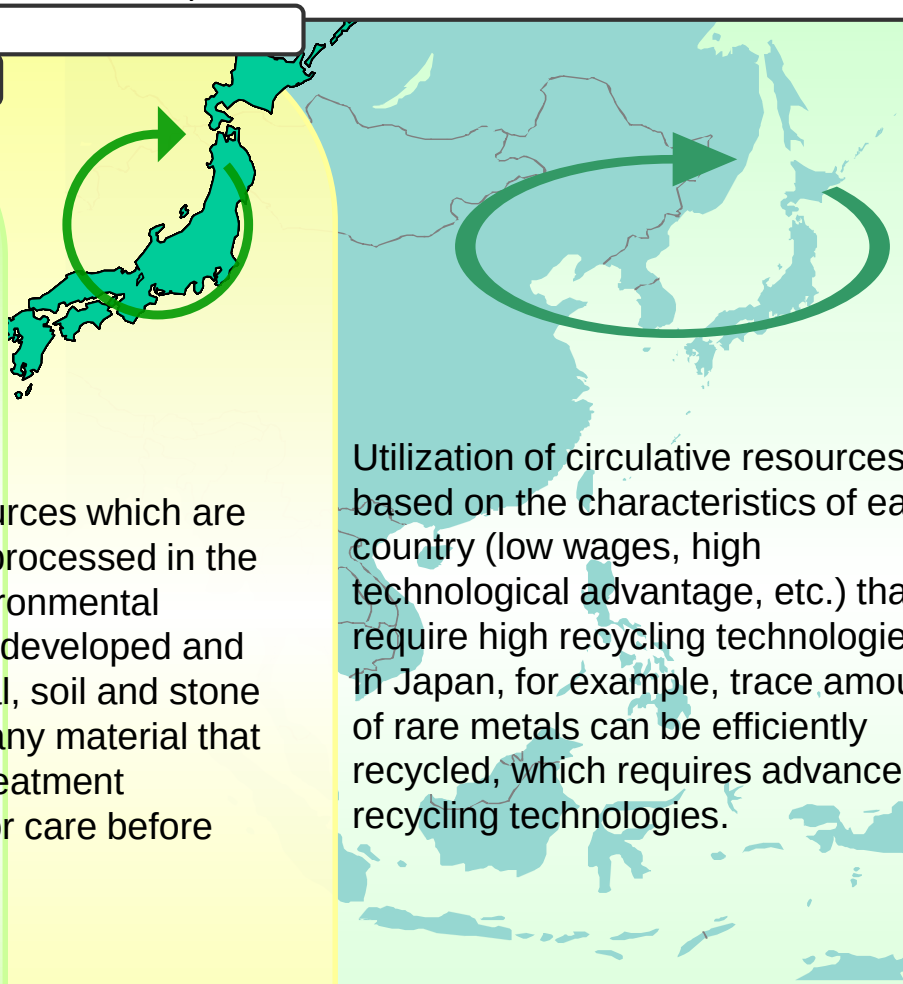
Domestic Material Cycle

Regional Material Cycle

Local Material Cycle







Community-based Sound Material Cycle

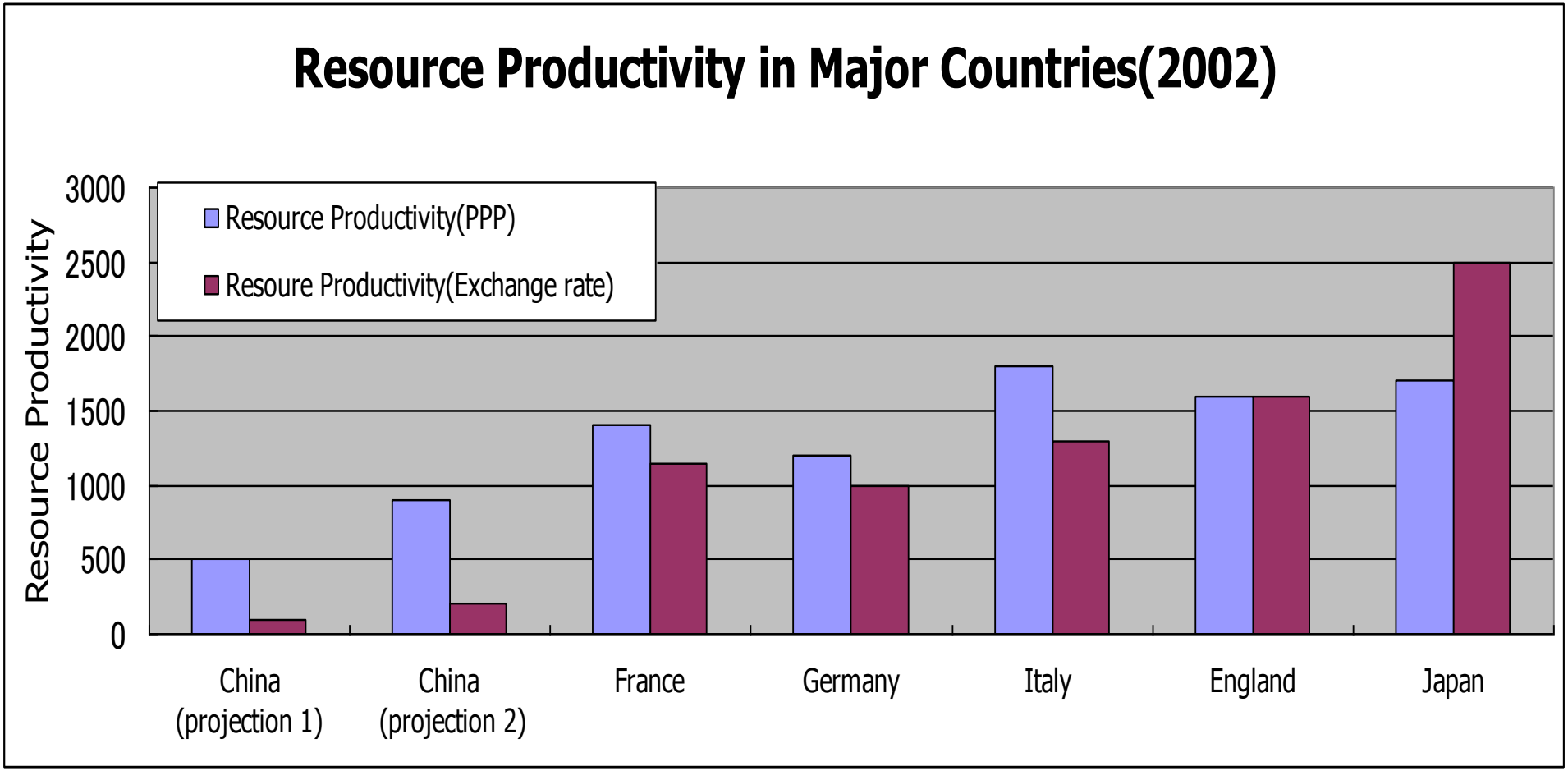
Reusing/ Repairing of materials/ devices, diversion of used cooking oil, etc.

Circulative resources considered as economically efficient and environmentally preferable with smaller impact.

Circulative resources which are most efficiently processed in the area where environmental business is well-developed and active (i.e., metal, soil and stone resources, and any material that requires extra treatment processes and/or care before disposal, etc.)

Utilization of circulative resources based on the characteristics of each country (low wages, high technological advantage, etc.) that require high recycling technologies. In Japan, for example, trace amounts of rare metals can be efficiently recycled, which requires advanced recycling technologies.

Resource Productivity in Major Countries



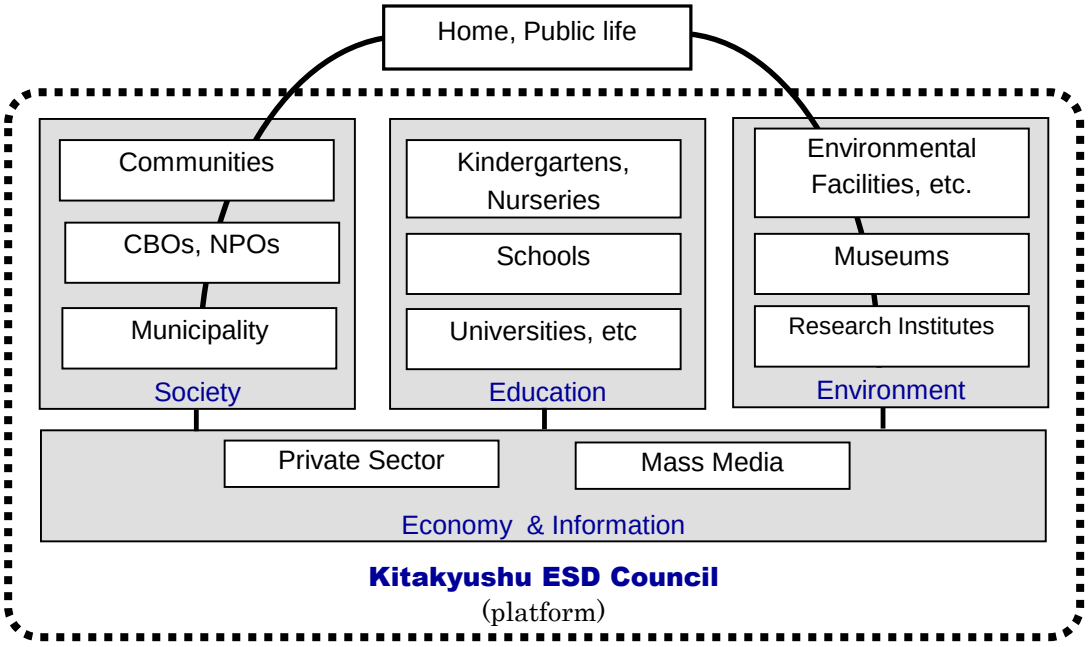
Comparison of resource productivity in major countries (2002)

For such cross-country comparison like this, which common currency used to convert the GDPs (gross domestic product) has great impact. It is pointed out that common GDP conversion in market exchange rates can give a very misleading picture of the size of a country's economy. This is particularly true for such country like China; therefore, here GDP adjusted for PPP (purchasing power parity) is used for the estimation to ensure more accurate comparison.

Estimation by Yuichi Moriguchi at the National Institute for Environmental Studies of Japan based on data from Liu Bin, Xu Ming, EUROSTAT, Ministry of the Environment of Japan, International Monetary Fund and others.

Enhancing Regional Partnership in ESD

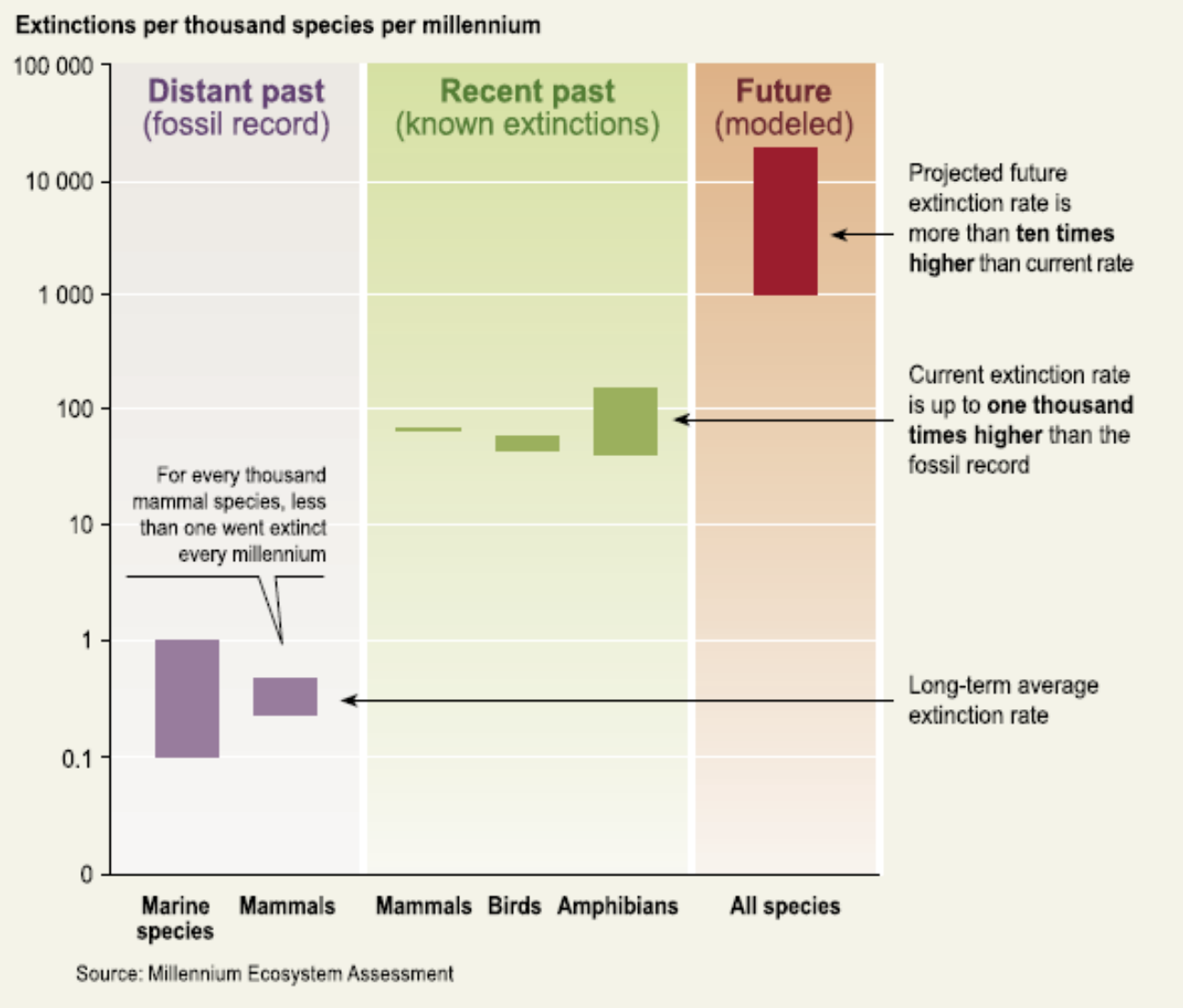
- **"Decade of Education for Sustainable Development"** has contributed greatly to educating people about sustainable development
- For further going, connect RCEs into networks t from **regional coalitions for the "Education for SD"**
- Kitakyushu City has been designated as an RCE in Japan
  - A famous model city for overcoming pollution and building a resource-circulating society
  - Training centers that support development of environmental technology in developing countries
  - Best suited for UNU **on-site training centre**



Kitakyushu Eco-Town

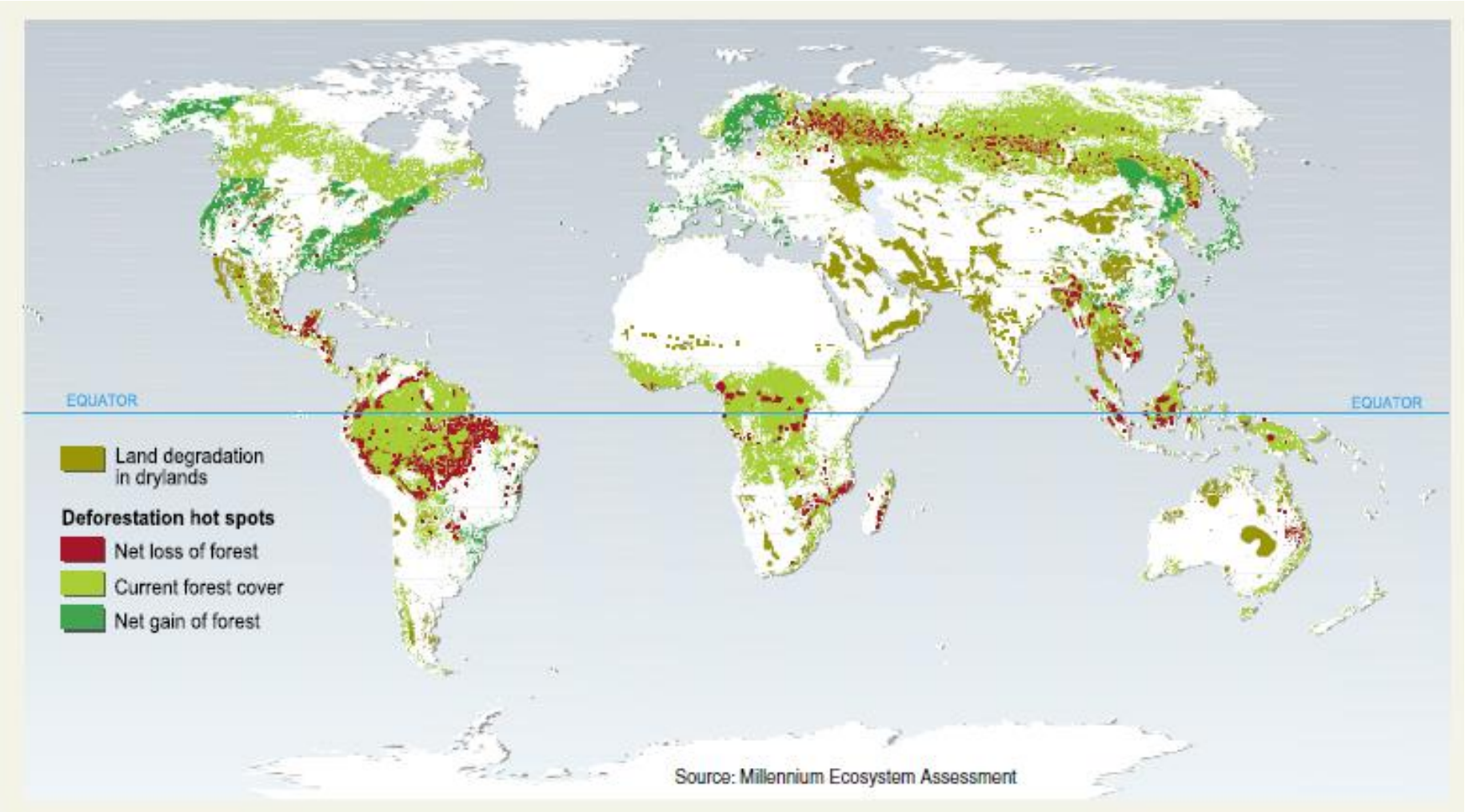
Comprehensive Environmental Industrial Complex, Hibiki Recycling Area

Crisis in Ecological System and Biodiversity



From *Report of the Millennium Ecosystem Assessment: Ecosystems and Human Well-being , Biodiversity Synthesis*

Land Cover Change in the Past Few Decades



From *Report of the Millennium Ecosystem Assessment: Ecosystems and Human Well-being , Synthesis*

National Strategy for Biological Diversity

Highlights of the New National Biodiversity Strategy of Japan

Crisis 1 :Species and habitat degradation due to excessive human activities

Crisis 2 :Degradation of *satochi-satoyama** due to insufficient level of management

Crisis 3 :Ecosystem disturbances caused by the introduced alien species and chemical contaminations

3 Policy Directions

1. **Reinforce Conservation Efforts**
2. **Restore Nature**
3. **Work Towards Sustainable Use**

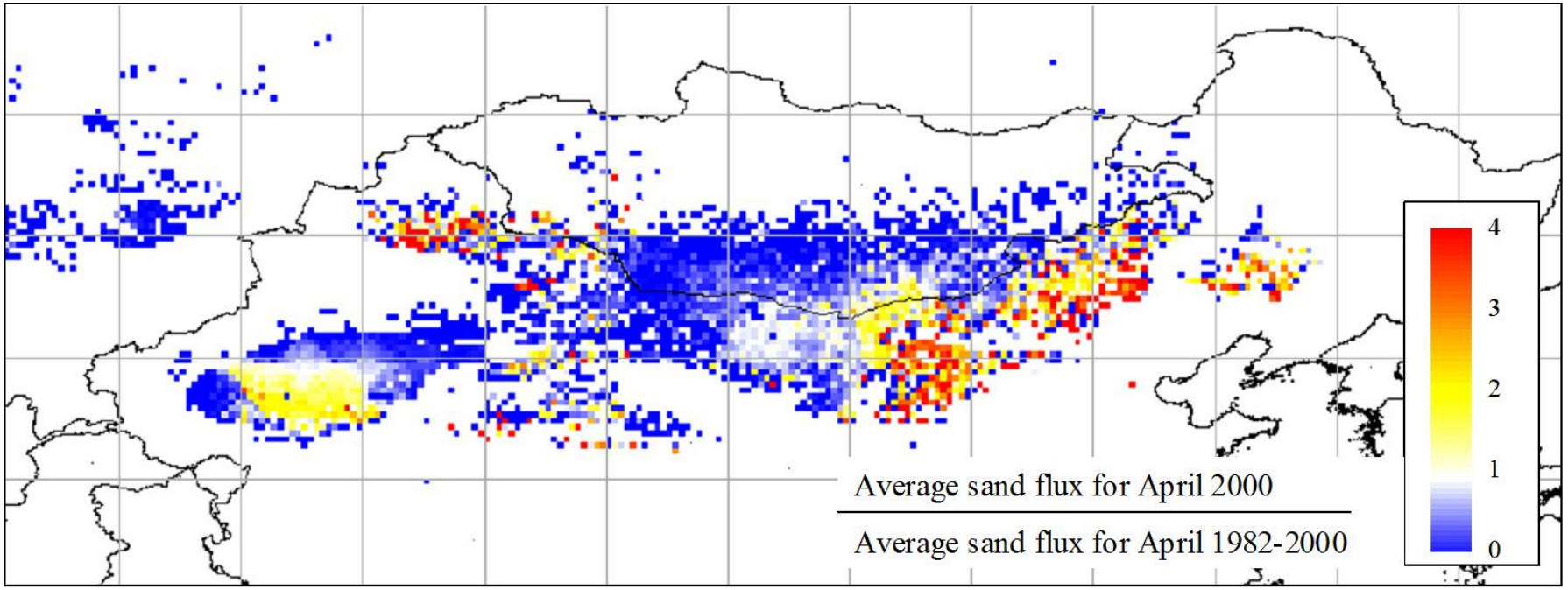
7 Priorities

1. **Conservation of Priority Areas and Formation of "Ecological Network (s)"**
2. **Conservation and Use of *Satoyama***
3. **Conservation of Wetlands**
4. **Restoration of Nature**
5. **Conservation and Management of Wildlife** (Reinforcing Countermeasures against Extinction of Species and Countermeasures against Alien Species)
6. **Development of Natural Environmental Data** (Monitoring Sites 1,000)
7. **Effective Conservation Methods and Others** (Improvement of Environmental Assessments and International Cooperation)

(From Ministry of Environment)

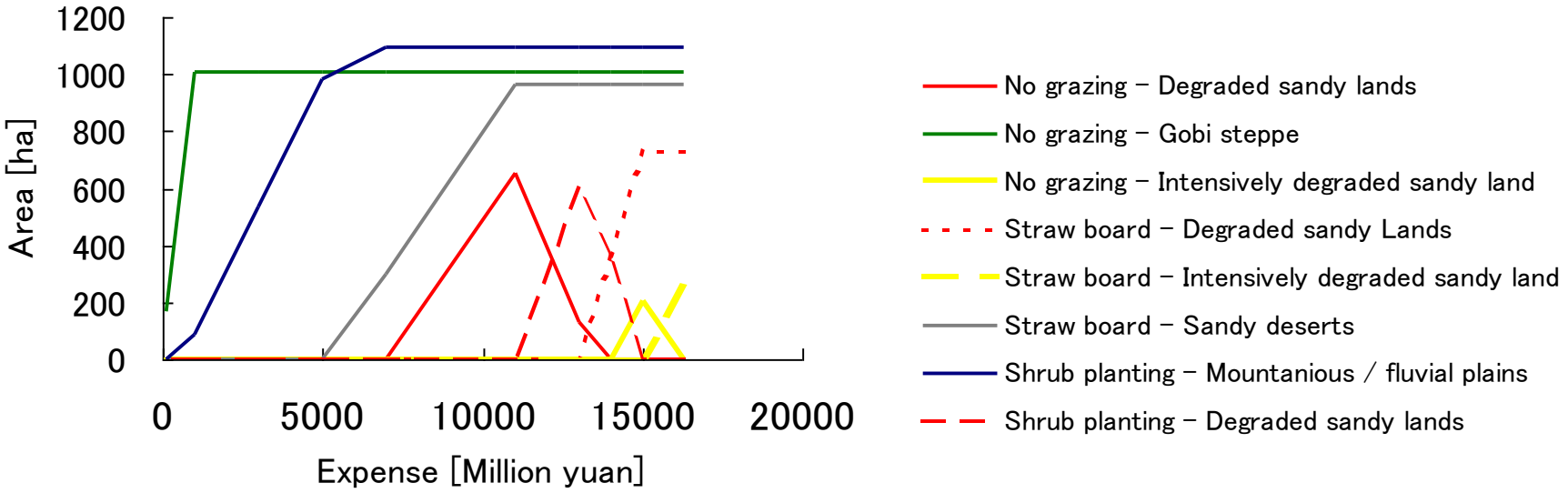
Sand-Dust Storms Become More Frequent?

- Numerical simulation by using Wind Erosion Assessment Model (WEAM; Shao 2000)
- Recent outbreaks of sand-dust storms occurred at the eastern edge of drylands in North-East Asia.



Effectiveness of Countermeasures

- The most efficient countermeasure is **prohibition of grazing in Gobi-steppe**



- **It is worth spending up to around 5,000M Yuan (660M USD).**

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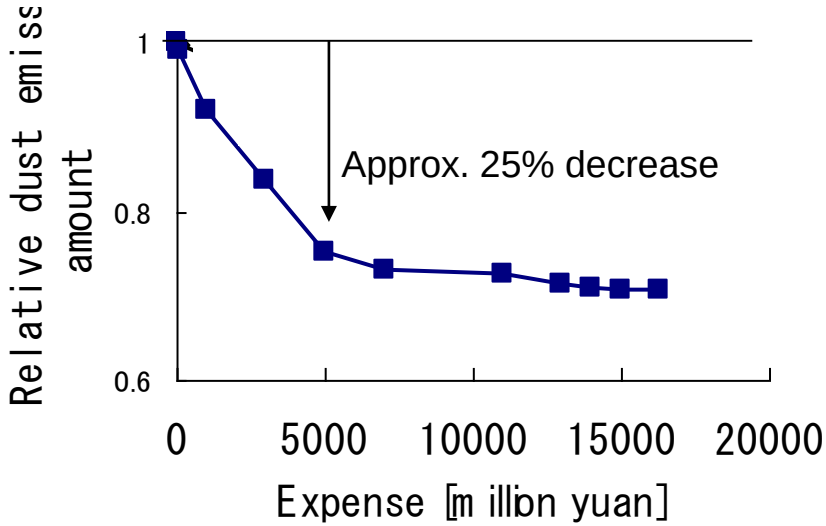
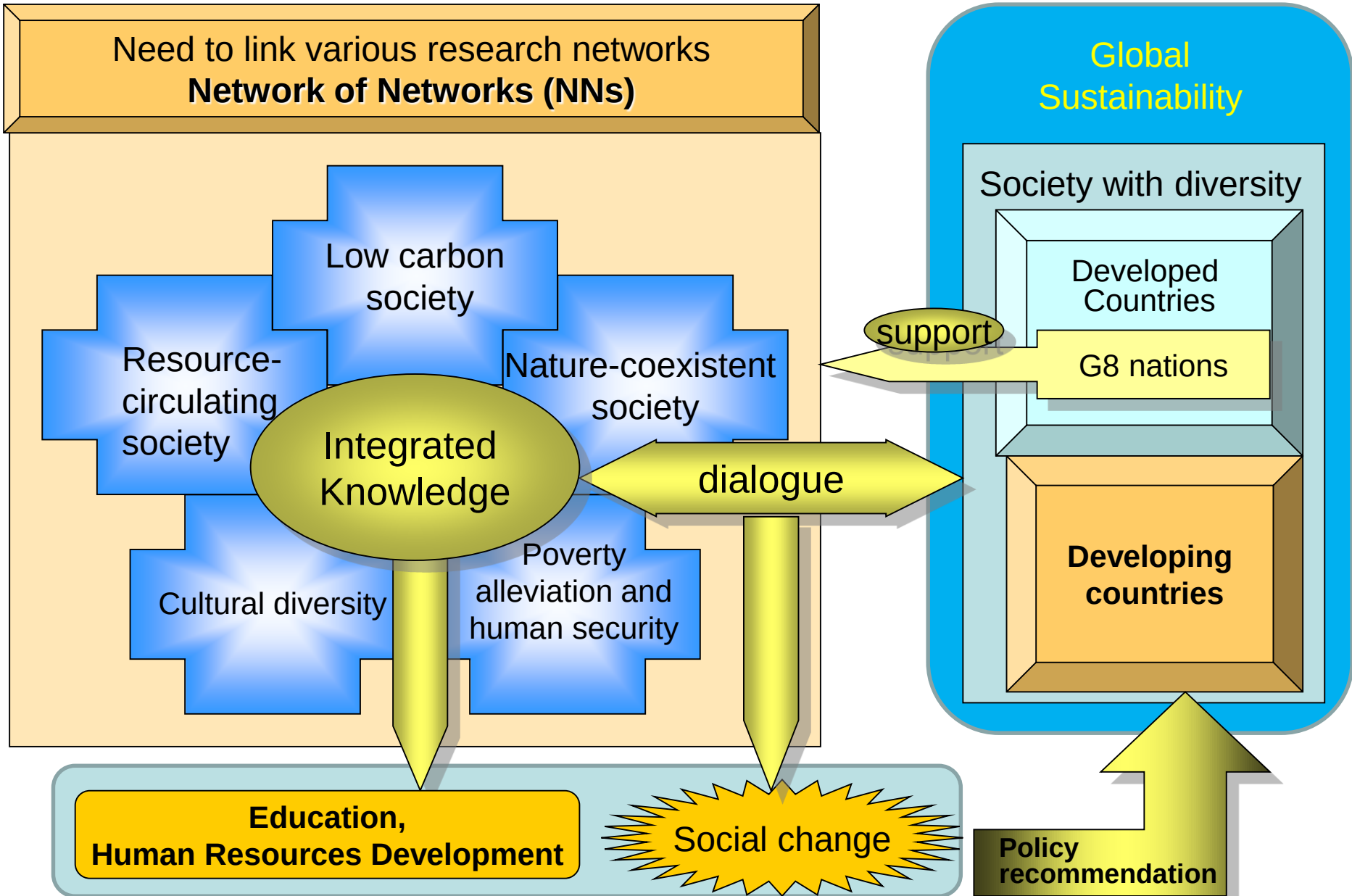
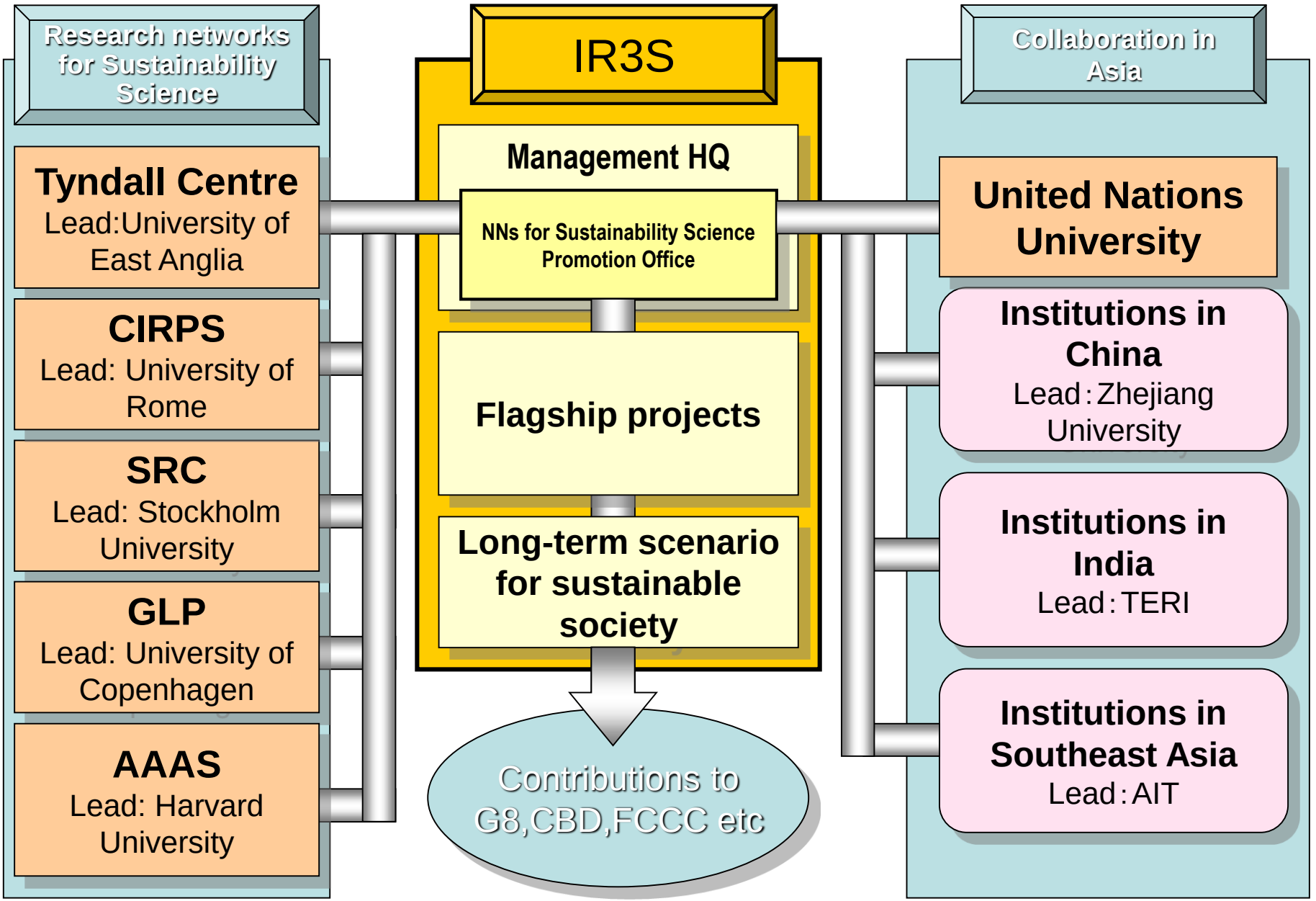
- **Economic damage by yellow dust in 2000 is about 1800M USD**



Knowledge Innovation for Global Sustainability



Forming International Research Networks




Thank you