Importance of Research Collaborations and GHG Emissions Inventory Development in Asia toward achieving the global 2 °C temperature change limit target

Tatsuya Hanaoka

Center for Social and Environmental Systems
National Institute for Environmental Studies
(NIES)
Topics

NIES & AIM activities on research networks/collaborations and inventory development

1. AIM (Asia-Pacific Integrated Model)

2. LoCARNet (International Research Network for Low Carbon Asia Research Network)

3. WGIA (Workshop on Greenhouse Gas Inventories in Asia)

4. SATREPS (Science and Technology Research Partnership for Sustainable Development) for Iskandar, Malaysia
Overview of AIM (Asia-Pacific Integrated Model) activities
Asia-Pacific Integrated Model (AIM) is an integrated assessment model to assess mitigation options to reduce GHG emissions and impact/adaptation to avoid severe climate change damages. The model is extended to sustainable development with Asian researchers.

See in detail on the website http://www-iam.nies.go.jp/aim/
<table>
<thead>
<tr>
<th>Country</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>National Institute for Environmental Studies, Kyoto University, Mizuho Information Research Institute</td>
</tr>
<tr>
<td>India</td>
<td>Indian Institute of Management, Ahmedabad, School of Planning and Architecture, Bhopal</td>
</tr>
<tr>
<td>Korea</td>
<td>Seoul National Univ., Korea Environment Institute</td>
</tr>
<tr>
<td>Thailand</td>
<td>Asian Institute of Tech., Thammasat Univ., King Mongkut’s Univ.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Univ. of Malaysia</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Bogor Agri. Univ., Bandung Institute of Tech.</td>
</tr>
<tr>
<td>Austria</td>
<td>IIASA</td>
</tr>
<tr>
<td>Netherlands</td>
<td>PBL</td>
</tr>
</tbody>
</table>

In addition, collaborating with Vietnam, Cambodia, Bangladesh, Nepal, Taiwan, ...
AIM models for LCS analyses

Emission Models

**Economic Model** (Dynamic Optimization Type)
- AIM/CGE [Global]
- AIM/CGE [National]
- AIM/CGE [Subnational]
- AIM/Enduse [Global]
- AIM/Enduse [National]
- AIM/Enduse [Subnational]

**Bottom-up Model** (Dynamic Optimization Type)
- AIM/CGE [Global]
- AIM/CGE [National]
- AIM/CGE [Subnational]
- AIM/Enduse [Global]
- AIM/Enduse [National]
- AIM/Enduse [Subnational]

**Accounting Model** (Static Balanced Type)
- AIM/Enduse [Global]
- AIM/Enduse [National]
- AIM/Enduse [Subnational]
- AIM/Extended Snapshot [Global]
- AIM/Extended Snapshot [National]
- AIM/Extended Snapshot [Subnational]

**Element & Transition Models**
- Population & Household Dynamics
- Macro Economic Frame
- Material Stock & Flow
- Cement Production
- Agriculture Production & Trade
- Households account & Lifestyle
- Input-Output
- Steel Production & Trade
- Transport Demand
- Municipal Solid Waste

**Global scale**
- Global emission pathways to climate stabilization
- Technological efficiency, mitigation potentials & costs

**Database**
- Simple Climate
- Temperature change
- Water
- Agriculture
- Human Health
- etc.

**Impact & Adaptation Models**
- 3E (Energy-Environment-Economic) Database
  - Energy Resource DB
  - Coal
  - Oil
  - Gas
  - Nuclear
  - Hydro
  - Geothermal
  - Solar
  - Wind
  - Biomass
  - Energy DB
  - Emission factor
  - Energy price
  - Electricity price
  - etc.
• How much will GHG emissions from Asia need to be reduced to halve global emissions by 2050 (2 degree target)?

Symposium: “Challenges to Low Carbon Asia” at UNU, 17 October 2013
Ten Actions for Realizing a Low Carbon Asia

What policies are keys?

“Ten Actions toward Low Carbon Asia” provides a guideline to plan and implement strategies for an LCS in Asia.

It considers the interrelationships between individual policies and the sequence in which they should be implemented.

Main findings

◆ The global emissions will become 1.8 times larger compared to the 2005 level, and emissions in Asia will be doubled under the reference scenario.

◆ There is potential to reduce GHG emissions by 69% compared to the reference case in Asia in 2050, by considering 10 actions.

Calculated by Dr. Fujimori
Developed National & Local Scenarios in Asia
- Bridging Research and Policy -

Policy makers
Central/regional government administration
Development Agencies
NGOs

Collaboration for LCS scenario development and building roadmaps
Request of more practical, realistic roadmaps and also tractable tools for real world

Each country’s domestic/local research institute
Application and development to actual LCS processes

Core research members
Development and maintenance of study tools/models

- See in detail on the website http://2050.nies.go.jp/LCS/-
Capacity building related to AIM
- Training Workshop at NIES -

- Trainings to young researchers in Asia, about AIM/Enduse and AIM/CGE model.
Overview of International Research Network in Asia - LoCARNet (Low Carbon Asia Research Network)
What is LoCARNet?
- Low Carbon Asia Research Network -

• An open network of researchers, research organisations, as well as like-minded relevant stakeholders that facilitates the formulation and implementation of science-based policies for low-carbon development in Asia.

• Proposed at ASEAN+3 EMM in October 2011

• Officially launched at “East Asia Low Carbon Growth Partnership Dialogue” in April 2012

• Three major activities: policy dialogue, knowledge sharing, and capacity development
LoCARNet – Working Policy

- **Network of leading researchers/experts** who are deeply involved in low-carbon development policy processes in Asia

- **Science-Science / Science-Policy Dialogue:** LoCARNet promotes research and training for policies towards low-carbon development by enabling a sufficient amount of dialogue among/between scientists and policy-makers.

- **Ownership of knowledge by countries:** LoCARNet encourages collaboration amongst researchers in-country whose research capacity and scientific knowledge are firmly grounded in their home countries.

- **Regional Collaboration:** LoCARNet aims to increase in research capacity in the AP region through knowledge sharing and information exchange, in the scheme of regional S-S-N cooperation.
LoCARNet – Activities and Outcomes

Lessons learnt from activities and outcomes from dialogues between Researchers and Policy-makers in Asia

Synthesis Reports:

LCS-RNet/LoCARNet Secretariat
http://lcs-rnet.org/index.html
c/o Institute for Global Environmental Strategies (IGES)
2108-11 Kamiyamaguchi, Hayama, Kanagawa 240-0115, Japan
E-mail: lcs-rnet@iges.or.jp
Fax: +81 (0)46 855 3809
Overview of WGIA
(Workshop on Greenhouse Gas Inventories in Asia)
# What is WGIA?
- Workshop on Greenhouse Gas Inventories in Asia -

- Capacity building for Measurability, Reportability and Verifiability -

<table>
<thead>
<tr>
<th><strong>Objective:</strong></th>
<th>To support countries in Asia to improve the quality of inventories via regional information exchange</th>
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</thead>
</table>
| **Organizers:** | Ministry of the Environment of Japan  
                             National Institute for Environmental Studies  
                             A host country from participating countries |
| **Participating countries:** | Cambodia, China, India, Indonesia, Japan, Republic of Korea, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand, Vietnam (14 countries) |
| **Observers:** | UNFCCC Secretariat, IPCC Task Force on National Greenhouse Gas Inventories, USEPA, Australia, JICA, etc. |
| **Number of participants:** | Approximately 100 to 120 people |
| **Style:** | Annual workshop since 2003  
                             (the latest one is the 12th WGIA held in 2014) |
| **Funds:** | Ministry of the Environment of Japan |

Plenary session in WGIA12
What do we do to improve GHG inventories in Asia?

➢ Sharing experiences concerning inventory development, preparation
➢ Updating inventory related information of each participating countries
➢ Identifying common issues and discussing possible solutions
➢ Discussion on cross-cutting and sector-specific issues concerning inventory
➢ Mutual Learning since 2011: In-depth methodological discussion between 2 countries by inventory-compilers

Outcomes

➢ Development of a network for inventory experts
➢ Development of “Roster of Regional Experts” and “WGIA-EFDB”
➢ Presentations made by the participants in the workshop are available on URL: http://www-gio.nies.go.jp/wgia/wgiaindex-e.html
➢ Workshop proceeding are published
Overview of WGIAs
- Sectoral Working Group & Mutual Learning Sessions -

- There are various issues for inventory preparation in each sector.
- It is good to discuss such sector-specific issues among sectoral experts for deeply discussing the issues.
- WGIAs provide the sectoral working group sessions in order to discuss particular sector-specific issues and to find some elements for solving the issues.

### Sectoral Working Group Sessions held in WGIAs

<table>
<thead>
<tr>
<th>WGI A</th>
<th>Cross-cutting</th>
<th>Energy</th>
<th>Agriculture</th>
<th>LULUCF</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGI A 6</td>
<td>Awareness raising of GHG inventories</td>
<td>Strategies to improve reliability of data</td>
<td>Use of remote-sensing data</td>
<td>Strategies to improve reliability of data</td>
<td></td>
</tr>
<tr>
<td>WGI A 7</td>
<td>Statistics for energy sector</td>
<td>Emission factors utilized for NCs</td>
<td>Activity data from remote-sensing and GIS</td>
<td>Improvement of data collection scheme</td>
<td></td>
</tr>
<tr>
<td>WGI A 8</td>
<td>Institutional arrangements for inventory preparation</td>
<td>Estimation methods and development of parameters</td>
<td>Follow up of WGI A 7 (remote sensing and GIS data)</td>
<td>Information exchange on the current status of sectoral inventory preparation</td>
<td></td>
</tr>
<tr>
<td>WGI A 9</td>
<td>-Non-CO₂ gas estimation - QA/QC systems</td>
<td>Estimation of CO₂ emissions from transport sector</td>
<td></td>
<td>Development of waste statistics</td>
<td></td>
</tr>
<tr>
<td>WGI A 12</td>
<td>-GHG Inventory at various levels</td>
<td>Relationship between national GHG inventories and mitigation measures, specifically NAMAs</td>
<td></td>
<td></td>
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</table>

Overview of SATREPS
(Science and Technology Research Partnership for Sustainable Development) for Malaysia Iskandar
Overview of SATREPS for Malaysia Iskandar

Research Team: Universiti Teknologi Malaysia (UTM), Kyoto University (KU), Okayama University (OU), National Institute for Environmental Studies (NIES)

Joint Coordinating Committee: Iskandar Regional Development Authority (IRDA), Federal Department of Town and Country Planning (JPBD), Malaysia Green Technology Corporation (MGTC)

Sponsorship: Japan International Cooperation Agency (JICA), Japan Science and Technology (JST)

Project Period: 2011 - 2016

Research Output:
1. Methodology to create LCS scenarios which is appropriate for Malaysia is developed.

2. LCS scenarios are created and utilised for policy development in IM.

3. Co-benefit of LCS policies on air pollution and on recycling-based society is quantified in IM

4. Organizational arrangement of UTM to conduct trainings on LCS scenarios for Malaysia and Asian countries is consolidated, and a network for LCS in Asia is established
Iskandar Malaysia: Key Challenges

Size: 2,216.3 km²
GDP: 35.7 bil. RM (2005) I 141.4 bil. RM (2025)

CO₂ Reduction target in Malaysia:
Voluntary 40% reduction of CO₂ emission intensity by 2020

Issues
Rapid urbanization and industrialization
Higher energy demand and CO₂ emission
Decouple economic growth and emission on fossil fuel

Blueprint – 3 main thrusts
– Green economy, community and environment.
=12 actions

Joint collaboration work of UTM, KU, NIES under SATREPS program
Green Economy, Green Community and Green Environment

<table>
<thead>
<tr>
<th>Unit</th>
<th>2005</th>
<th>2025 BaU</th>
<th>2025 CM</th>
<th>2025BaU</th>
<th>2025CM /2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Energy Demand (Mtoe)</td>
<td>2.5</td>
<td>7.6</td>
<td>5.2</td>
<td>3.11</td>
<td>2.14</td>
</tr>
<tr>
<td>GHG emissions (MtCO2eq)</td>
<td>10.5</td>
<td>30.2</td>
<td>18.3</td>
<td>2.88</td>
<td>1.74</td>
</tr>
<tr>
<td>Per Capita CO2 Emissions (tCO2eq)</td>
<td>7.7</td>
<td>10.1</td>
<td>6.1</td>
<td>1.30</td>
<td>0.78</td>
</tr>
<tr>
<td>GHG Intensity (kgCO2eq/RM)</td>
<td>0.29</td>
<td>0.21</td>
<td>0.13</td>
<td>0.73</td>
<td>0.44</td>
</tr>
</tbody>
</table>

12 Actions Towards Low Carbon Future

**Green Economy**
1. Integrated Green Transportation
2. Green Industry
3. Low Carbon Urban Governance
4. Green Building and Construction
5. Green Energy System and Renewable Energy

**Green Community**
6. Low Carbon Lifestyle
7. Community Engagement and Consensus Building

**Green Environment**
8. Walkable, Safe and Livable City Design
9. Smart Urban Growth
10. Green and Blue Infrastructure and Rural Resources
11. Sustainable Waste Management
12. Clean Air Environment

See in detail on the website
Identifying Low Carbonizing Potential in Iskandar Malaysia

Prime Minister approved Dozen Action as official program in Iskandar Malaysia

Continuous Discussion with Stakeholders including researcher, policymaker, business, NGOs

March 2014
Approvals and Implementation Committee (AIC) in IRDA endorsed the Blueprint and Roadmap as formal government plan
Timing is important!

Thank you for your attention!

Contact: hanaoka@nies.go.jp