Tailoring EW-MFA (Economy-Wide Material Flow Accounting/Analysis) information and indicators to developing Asia:

increasing research capacity and stimulating policy demand for resource productivity

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Introduction

Sustainable resource management is becoming a policy concern

- Resource scarcity, resource price fluctuation
- For Both developed and developing countries.
- Resource circulation (3R), Resource productivity (RP)

Asian developing countries:
Rapid industrialisation / emerging economies
Benefit from monitoring Material Flow data

- Rely heavily on imports of raw materials and exports of manufactured goods
- Few countries in Asia
- If they apply EW-MFA for policy development, it would contribute to improving global resource productivity

Would like to Enhance capacity of developing Asia to utilise EW-MFA indicators for policy development

Analysing economic & social driver to utilise EW-MFA / Resource productivity indicator for policy in G8 and OECD countries

Brief assessment of the national capacity for MFA in selected developing countries

New Project: “Stimulating policy demand for indicators on sustainable resource use and resource productivity and strengthening research capacity for Economy-Wide Material Flow Analysis in Asia”
Analysing economic & social driver to utilise EW-MFA / Resource productivity indicator for policy (2007-08)

- Analysed policy application of EW-MFA in G8 and Selected OECD countries
- Assessed Activeness in Policy application of EW-MFA by the following points

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<tr>
<th>Implementation</th>
<th>Focuses</th>
<th>National target</th>
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<tbody>
<tr>
<td>Conducts EW-MFA at</td>
<td>• Sustainability and <strong>Efficiency</strong> of resource-use,</td>
<td>the setting of</td>
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<td>• Whole country/national level</td>
<td>• Environmental <strong>impacts</strong> due to material use</td>
<td>• <strong>national target</strong></td>
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<td>• On Regular basis</td>
<td>• <strong>Sustainability</strong> of waste management</td>
<td>• <strong>time boundary to achieve the target</strong></td>
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<td>• Under the initiative of governments</td>
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**Methodology**

- Policy application of EW-MFA: Literature survey based on a report of OECD (2007) with a combination of on-line data surveys officially available from governmental websites
- Comparative analysis on Policy application of EW-MFA and its relations with economic characteristics

- About Position and perception of EW-MFA Indicators in G8 governmental policies: On-line data surveys officially available from governmental websites and Interview survey with a combination of questionnaire to
  - the governmental officials of ministries in charge of 3R-related policies or statistics office
  - research institutes in charge of development of MFA indicators
Analysing economic & social driver to utilise EW-MFA / Resource productivity indicator for policy (2007-08)

- Countries with (a) large trade deficit for natural resources and (b) large exporting-oriented manufacturing sector
  - Active in integration of EW-MFA into governmental policy development
  - Strong incentives to manage natural resources efficiently
  - Especially **Germany**, **Italy** and **Japan** have time boundary target setting.

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- **Active**
  - US
  - France
  - Norway
  - Denmark
  - Sweden
  - Canada
  - Russia
  - Australia
  - Germany
  - Japan
  - Italy
  - UK
  - Austria
  - Italy
  - Japan
  - Finland
- **Less Active**
  - Russia
  - Sweden
  - Canada
  - Australia
  - Norway
  - Denmark
  - Sweden
  - Canada
  - Russia
  - Australia
  - Germany
  - Japan
  - Italy
  - UK
  - Austria
  - Italy
  - Japan
  - Finland

**Trade of ore, metals and fuels** (UNCTAD Handbook of statistics 2007)

**Chemical products, machinery and transport equipment and other manufactured goods** (UNCTAD Handbook of statistics 2007)

**World Development indicator 2008**
Indicators and target setting of resource productivity in G8 countries
(2007-08)

**MFA indicator and national target**
- EU countries has developed MFA indicator as National Sustainable Development indicator, but only Italy and Germany as target to achieve.
- US and Canada no plan to calculate MF indicator and set target.
- Japan practically uses MF indicators for policy development on 3R.

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<tr>
<td>MFA indicator</td>
<td>DMC</td>
<td>TMR</td>
<td>Raw Material Productivity = GDP/(DMI-biomass)</td>
<td>DMC</td>
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Its position in national policy
- Sustainable Development Indicator
- National Strategy for Sustainable Development
- National Sustainable Development Indicator by IFEN (planned: TMC, TMR)
- Sustainable Development Indicator

Basic Plan for Establishing the Sound Material Cycle Based Society
- Year 2015
- RP: 420,000JPY (5,000US$/t)
- Cyclical Use Rate: 14-5%
- Final Disposal Amount: 23Mt

Target
- No
- 90% reduction of TMR in 2050
- Double RMP by 2020
- No
- No
- No
- No
Indicators and target setting of resource productivity in G8 countries

### Opinion to National / International Common Target Setting

- Japan and EC are positive to policy binding goal setting in national target
- Some countries are against to set international common target setting
- But, many countries are positive to develop international common indicator
  - Most countries agree, “at least at the expert level”, on the effectiveness of MFA for resource management policy.

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- **Opinion to national target**
  - Useful but not as the goal setting of government
  - Not regarded as the implementation target of government
  - Not considered as goal setting, but rather an indicator for making synergies among different policy areas
  - No strong emphasis on material use
  - Energy efficiency is more important, but likely set resource productivity targets in future
  - Difficult to set explicit national targets due to powerful local governments
  - Focus on particular material flows of concern, effectiveness of an aggregated indicator is not clear
  - Utilise indicator & target for policy assessment on Basic Plan for Establishing the Sound Material Cycle Based Society

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<th>Common target setting</th>
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| Common indicator development | ○ | ○ | ○ | △ | △ | × | ○ | ○ |
Indicators and target setting of resource productivity in G8 countries

- Significantly influenced by the difference in **Industrial and Economic structure** as well as **political systems** (federal or central government).

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<thead>
<tr>
<th>Industrial and Economic structure</th>
<th>Political system</th>
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</table>
| • Economies with *relatively large manufacturing industrial sector* are interested  
  - Reduction of materials input  
  - *the economies’ dependence on resource extracted* in other countries. | • Especially the *relationship between central and local governments* influences  
  - Data collection  
  - Possibility to set national target indicator |

- #######
Assessment on the national capacity for EW-MFA in selected developing countries (2007)

- All countries surveyed seem to have most of the basic input and output related statistics available.
- Some countries seem to have sufficient data to estimate their DMI and DMC.
- The availability of MFA data in some countries surveyed is not much different from in some OECD countries.

### Table: Overview of the main findings of the study

<table>
<thead>
<tr>
<th>Country</th>
<th>Input data</th>
<th>Output data</th>
<th>Sector data</th>
<th>Use in Public Policy</th>
<th>SFA</th>
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<td>All</td>
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**Methodology**

Questionnaire survey to related Ministry, Statistical office, University, Research Institute and Others
Assessment on the national capacity for EW-MFA in selected developing countries (2007)

- A large number of organisations, including governmental bodies and academia, are already collecting statistics relevant to MFA,
- HOWEVER, data collection is fragmented
  - split up among many governmental bodies and research institutes.
- There is a lack of coordination
  - difficult to get an overview of existing data, and
- Limited awareness among policy makers on the potential benefits of MFA

Figure: The vicious circle of low capacity for MFA studies and low utilisation of MFA in policy making

How can we break the vicious circle…
For capacity development in Asia - recommendation

- Establishment of national focal points for **coordination of MFA data collection and compilation** → ①②

- **Training and capacity development** to harmonise data definitions and documentation formats → ②

- Development of case studies **illustrating how MFA has provided policy makers with an improved basis for policy design** → ③④
  - Promote interaction between analysts/experts and policy makers on good practices

- **International collaborative research projects** to further develop the capacity of Asian countries (governments, academia and research institutes) to complete and analyse MFA data → ①②③④
A Project Proposal - “Stimulating policy demand for indicators on sustainable resource use and resource productivity and strengthening research capacity for Economy-Wide Material Flow Analysis in Asia”

1. Deepen the Assessment of the existing capacity for EW-MFA, and for the use of MF indicators for policy making

2. Identify the potential benefits of MF indicators in policy processes of developing Asian countries
   - Analysing Economic & social driver for Asian countries to effectively utilise EW-MFA for 3R, Economy, Resource productivity and decoupling policy

3. Explore Effective ways to upgrade capacity for systematic and regular EW-MFA activities in developing Asia
Work 1: Assessing existing EW-MFA capacity

- **Data availability** of MF related statistics
  - Availability & Consistency with international data
  - Sectral data
  - By Exploring existing national statistics and international statistics as complement
  - Collectors of data

- **Institutional Capacity**
  - Institutional arrangement of organizations which collect MF related environmental information/statistics or
  - Existence of organization which coordinate (environmental) information/statistics collected by several different organization in the country, and

  - Previous/existing applications of MF related indicators to policy making

  - **Awareness/needs** on the effectiveness EW-MFA for 3R/decoupling/ RP policies among stakeholders
    - Government (ministries and national institutes), Industry associations, others
Work 2: Identify the potential benefits of MF indicators

- Economic & social driver to effectively utilise EW-MFA for 3R, Resource productivity and decoupling policy

- **Economical structure and the development status**
  - Poverty, large informal economy,
  - Transition agrarian to industrial economies,
  - High density developing economies
  - Exporters of large amounts of products to developed countries.
  - High dependency on biomass resources
  - Large investments in building up their infrastructure

- **Waste Composition**
  - Organic waste is major components in Asia
  - Potential of material resource cycle

- **Institutional and political system**
  - Countries’ administrative structure
  - Role of local government to national statistical system
    - impact the availability of nation-wide MFA data.

- Population, Population density,
- GDP, GDP/capita,
- Trade (metal, energy, manufactured goods etc.),
- Economic structure(sector contribution to GDP),
- Sectoral Investments,
- Other data
Work 3: Explore Effective ways to upgrade capacity

- Formulating **roadmap to establish systematic and regular implementation of EW-MFA and Resource Productivity analysis.**
  - Drawing experiences in OECD countries for developing adapted MFA tools.
  - Expected institutional arrangements for EW-MFA data collection, MF analysis and policy-making,
  - Role-sharing and collaboration among the organisations involved
  - Ways to strengthen the availability of MF data
    - Identifying challenges to develop sectoral data & internationally consistent statistic format
  - Identifying policy domains and users (ministries, etc.) that may be informed by EW-MFA
  - Developing effective package of EW-MF indicators for policy use that reflect the situation in developing Asia to achieve sustainable resource use.
Thank you!
Any recommendation, suggestion and comments are welcomed!

Chika Aoki-Suzuki (Ms.)
e-mail: aoki@iges.or.jp
Needs for indicators for international hidden flow / environmental burden shifting of resource use

- As a MFA-indicator, TMR is an indicator to reflect hidden flow associated with domestic material extraction and imports.
- The countries with relatively large manufacturing sector have more policy interest over dependence on materials import and associated impact from resource extraction.

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- interested in environmental burden shifting of resource use resource use
- necessary to show foreign constrains of resource use
- Raw Material Productivity does not reflect biomass, so alternative indicator is considered.
- Raw Material Productivity does not reflect biomass, so alternative indicator is considered.
- indirect and foreign flows are considered important at the level of experts (IFEN)
- prefers indicators reflecting environmental burden such as ecological footprint
- no plan to calculate because of difficulties to make consensus on methodologies and data to use.
- interested in methodological development
- planning to apply TMR to quantify environmental impacts at global level
Linking MFA and environmental impact

EU emphasized the significance of environmental impact indicator for harmonization of development and environmental conservation.

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-Interesting step (ISTAT)
-Methodology development is necessary
-One of alternative indicators to be compared for the next step
-strong interest in the development of an MFA-base environmental indicator (IFEN)
-would like to introduce EMC calculation
-no plan to working together for methodology development
-not opposing to setting conversion factors to be shared internationally

Resource productivity indicator based on MFA is better served to show win-win solution between resource conservation and industrial competitiveness.

Need careful assessment for the integration of environmental impact into MFA
(need to ask hotta-san the context of this sentence)
aoki, 2010/10/28